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Class I, HEXAPODA.

Order I, HYMENOPTERA.

A LIST OF THE HYMENOPTERA OF THE PHILIPPINE ISLANDS, WITH DESCRIPTIONS OF NEW SPECIES.

By William H. Ashmead, M.A., D.Sc.,

Washington, D. C.

Considering the extent of the Philippine Islands, extending as they do over 1,200 miles of territory, our knowledge of the Hymenopterous fauna is singularly meager. More attention should be given to collecting these important insects. Since the islands came into the possession of the United States much material has been sent to the National Museum, and with the hope that more attention will be given to the collecting and study of this order in the Philippines, I give below a list of the known species, and describe most of the new species now in our collection.

The vast majority of the material, upon which this contribution is based, was received from Dr. P. L. Stangl, U. S. Army, and Father W. A. Stanton, of Manila.

Father Stanton's contributions to the National Museum, not only in this but in other orders, are especially valuable, and he has been eminently successful in discovering many new species in genera not before recorded from the Philippines.

I have arranged the list in systematic order, according to my scheme of classification, and have enumerated all families, whether

represented or not, in order to show how little we really know of the Philippine Hymenopterous fauna, the amount of work still to be done in the order, and to direct attention to collecting material in those families still unrepresented. I am convinced that most of these families will be found to have hundreds of representatives in the islands.

In this list only 183 species are recorded, a ridiculously small number considering the extent of territory covered. A good collector ought to take that number in a couple of days collecting in the Parasitica alone, by using the sweeping net.

Suborder I. HETEROPHAGA.

Superfamily I. *APOIDEA.*

Family I. APIDÆ.

1. **Apis dorsata Fabr.** Philippine Islands.
2. **Apis mellifera Linné.** Philippines (introduced).
3. **Apis nigrocincta Smith.** Manila (Father W. A. Stanton).
4. **Apis zonata Smith.** Bacoor, P. I. A single ☿ received from Dr. P. L. Stangl.
5. **Apis unicolor Latr.** Luzon, Cagayán, Alcalá.

Family II. BOMBIDÆ.

None.

Family III. EUGLOSSIDÆ.

None.

Family IV. PSITHYRIDÆ.

None.

Family V. ANTHOPHORIDÆ.

6. **Anthophora cingulata Fabr.** Philippines.
7. **Anthophora zonata Linné.** Manila (M. L. Bobb).

Family VI. NOMADIDÆ.

8. **Crocisa lamprosoma Boisd.** Luzon, Manila, Bulacan, Lolomboy. Philippines.
9. **Crocisa nitidula Latr.** Philippines. Cape Eugeno.
10. **Nomada lusca Smith.** Manila. One ♂ specimen received from W. A. Stanton.

Family VII. CERATINIDÆ.

11. **Ceratina compacta Smith.** Philippines.
12. **Ceratina hieroglyphica Smith.** Philippines.
13. **Ceratina philippinensis, new species.**

♀. Length 6.5 to 7 mm. Black, punctate, the head with a slight æneous tinge in certain lights, more coarsely and closely punctate, especially on the vertex, marked with yellow as follows: A long stripe on temples back of eyes, two oblique, nearly confluent, spots on the forehead in front of the ocelli, a hat-shaped mark (▟) on the face, a transverse line above this mark, and a band along the inner orbits, narrowed posteriorly and extending to beyond the insertion of the antennæ, yellow; labrum, a faint spot near middle of the mandibles, the scape, except a black spot above, and the palpi, pale yellow; the upper margin of the pronotum, the tubercles, the tegulæ, two longitudinal lines on the disk of the mesonotum, and a stripe at the sides next the tegulæ, yellowish-white; the scutellum and bands at apex of abdominal segments 1 to 5 are yellow; the band on the third segment is broadly interrupted medially, that on the fourth very slightly interrupted by a slender median black line or at least is incised medially; the bands on segments 2 to 4 are broadly sinuated from near the middle and broadened towards the lateral margin; the ventral segments 1 to 4 are yellow at apex, the last being wholly black; the front femora, except a black band at base, the middle and hind femora at apex, and all the tibiæ except a stripe on the hind tibiæ within, and the tarsi, are pale yellowish or yellowish-white. Wings hyaline, the stigma and veins dark brown or brown-black; the second and third cubital cells each receive a recurrent nervure.

Type.—No. 7692, U. S. National Museum.

Manila. Described from four specimens received from Father W. A. Stanton.

Family VIII. XYLOCOPIDÆ.

14. **Xylocopa æstuans Linné.** Luzon, Cagán, Alcalá.

15. **Xylocopa bryorum Fab.** Luzon.

16. **Xylocopa bombiformis Smith.** Manila (Father W. A. Stanton).

17. **Xylocopa collaris Lepel.** Luzon.

18. **Xylocopa dissimilis Lepel.** Manila (Father W. A. Stanton).

19. **Xylocopa ghilianii Grib.**

20. **Xylocopa iridipennis Lepel.**

21. **Xylocopa leucocephala Rits.**

22. **Xylocopa philippinensis Smith.** Manila (Father W. A. Stanton). Fr. Casto de Elera in his "Catalogo de toda la Fauna Filipinas" records also *X. violacea* Fabr., a European species.

23. **Xylocopa sororina Smith.**

24. **Xylocopa trifasciata Grib.**

25. **Platynopoda latipes Drury.** Philippine Islands.

26. **Platynopoda tenuiscapa Westw.** Philippine Islands.

Family IX. MEGACHILIDÆ.

27. **Megachile atrata Smith.**

28. **Megachile clotho Smith.** Luzon, Cape Eugeno.

29. **Megachile lachesis Smith.** Luzon.

30. **Megachile laticeps Smith.**

31. **Megachile** sp. ? Manila (M. L. Robb).

Family X. STELIDIDÆ.

32. **Cœlioxys philippensis Bingh.** Luzon, Cape Eugeno.

Family XI. PANURGIDÆ.

None.

Family XII. ANDRENIDÆ.

Hoplonomia, new genus.

This genus on account of the abdomen being banded is allied to *Paranomia* Friese, but is readily separated from it and *Nomia, sens. str.* by the post-scutellum in both sexes, being armed with two straight spines, the scutellum with a median depression and with the hind angles ending in a small tubercle.

Nomia elliotii Smith and *N. westwoodii* Grib. described from India, belong to this genus.

33. **Hoplonomia quadrifasciata, new species.**

♀. Length 9 mm. Black, closely punctate, the apical margins of the abdominal segments 2 to 5 depressed, smooth and shining, fasciate with yellow or greenish-yellow; face anteriorly from the insertion of the antennæ, the cheeks, the pronotum above and on each side including the tubercles, a line at base of scutellum, the post-scutellum, and the metapleura, clothed with a dense whitish or yellowish-white pubescence; legs black, the hind tibiæ, except a large black spot behind, and the basal joint of hind tarsi, except at apex, yellowish; the hind femora are much swollen; wings hyaline, the apical margins subfuscous; the second cubital cell small, quadrate, a little higher than long, and receiving the recurrent nervure a little beyond the middle.

♂. Length 8 mm. Agrees well with the ♀, except that the abdomen is narrower, the terminal ventral plate and the genitalia being wholly honey-yellow, while only the apex of the hind tibiæ is yellow. The basal joint of the hind tarsi is entirely black.

Type. — No. 7720, U. S. National Museum.

Manila. Described from a ♂ and ♀ specimen received from Father W. A. Stanton.

34. **Paranomia stantoni, new species.**

♂. Length 8 mm. Black, the head below the antennæ and the depressed apical margins of the abdominal segments 2 to 6, white, the mesonotum and the scutellum clothed with a dense fulvous pubescence, the face, cheeks, temples, sides of thorax, legs, and the venter with a whitish pubescence; mandibles black; second

and third joints of the flagellum about equal in length, not quite twice as long as the first which is the shortest joint; legs black, the inner apical angle of the hind tibiæ, which is triangularly produced, and the basal half, or a little more, of the claws, honey-yellow; the hind femora are much swollen. Wings hyaline, faintly tinted, the tegulæ and costal vein pale yellowish, the subcostal vein and the stigma brown-black, the internal veins brownish, the first branch of the basal nervure is curved inwardly much as in *Halictus*, the first and third cubital cells are long, about equal, the second small, wider than long, about one third the length of the first.

The abdomen is smooth and shining, the first segment is closely finely punctate, clothed with a whitish pubescence, but with a smooth, shining, impunctate space at the anterior middle, the following segments all smooth, almost impunctate, with some black, sparse hairs, the apical white margins with some white hairs.

Type. — No. 7693, U. S. National Museum.

Manila. Described from a single specimen received from Father W. A. Stanton, in honor of whom the species is named.

Family XIII. COLLETIDÆ.

This family is well represented in India and should have many representatives in the Philippines.

Family XIV. PROSOPIDÆ.

35. **Prosopis philippinensis, new species.**

♀. Length 6 to 6.5 mm. Black, polished, impunctate, except the labrum and the apex of the clypeus which are sparsely punctate, and the abdominal segments 3 to 6 which are shagreened. The face is depressed and there is a broad yellow band that extends from a little below the insertion of the antennæ to the labrum; the tarsi, except the basal joint, and the extreme apical margin of abdominal segments 2 to 5, are honey-yellow; claws pale with the teeth black. Wings hyaline, the tegulæ yellowish-white, the stigma, except the outer edge, and the veins, brown.

Type. — No. 7694, U. S. National Museum.

Manila. Described from 2 ♀ specimens taken by Father W. A. Stanton.

This is not a genuine *Prosopis* but the material is too limited for me to dissect and study the trophi to make certain of its position.

Superfamily II. *SPHECOIDEA.*

Family XV. OXYBELIDÆ.

None recorded from the Philippines, but the family surely has representatives there.

Family XVI. CRABRONIDÆ.

Should be found in the Philippines.

Family XVII. PEMPHREDONIDÆ.

No species yet recorded from the Philippines.

Family XVIII. BEMBICIDÆ.

This family should be well represented.

Family XIX. LARRIDÆ.

36. **Notogonia laboriosa Smith.** Philippines.

Family XX. PHILANTHIDÆ.

37. **Cerceris vafra Bingh.** Luzon.

Family XXI. TRYPOXYLIDÆ.

None are yet known from the Philippines.

Family XXII. MELLINIDÆ.

Not known in the Philippines.

Family XXIII. NYSSONIDÆ.

This family should be represented in the islands.

Family XXIV. STIZIDÆ.

Should be well represented, but no species is yet recorded.

Family XXV. SPHECIDÆ.

38. **Sphex argentata Dahlb.** Manila (Father W. A. Stanton).

39. **Sphex aurulentus Fabr.** Philippines.

40. **Sphex maurus Smith.** Luzon.

41. **Sphex morosus Smith.** Luzon.

42. **Sphex serica Fabr.** Manila (Father W. A. Stanton).

43. **Sphex umbrosus Christ.** Philippines.

44. **Chlorion lobatum Fabr.** Manila.

45. **Sceliphron bengalensis Dahlb.** San Rafael, P. I. (A. P. Ashby).

46. **Sceliphron madraspatanum Fabr.** Philippines. Bay Laguna Prov. (Dr. P. L. Stangl).

47. **Sceliphron violaceum Dahlb.** Philippines. Fr. Casto de Elera has included in his "Catalogo de toda la Fauna Filipinas" *Ammophila subulosa* Fabr., a European species.

48. **Ammophila superciliaris Saussure.** Philippines.

Family XXVI. AMPULICIDÆ.

49. **Ampulex compressa Fabr.** Philippines.

Superfamily III. *VESPOIDEA.*

Family XXVII. CEROPALIDÆ.

50. **Salius bipartitus Lepel.** Philippines.
51. **Salius flavus Fabr.** Philippines.
52. **Salius fulgidipennis Sauss.** Philippines.
53. **Salius peregrinus Smith.** Luzon.
54. **Salius sericosoma Smith.** Philippines.
55. **Macomeris violacea Lepel.** Luzon.
56. **Pseudagenia unifasciata, new species.**

♀. Length 8 mm. Black, clothed with a fine glittering, silvery white pubescence, the head and thorax very finely closely punctate or shagreened; mandibles toward apex reddish but with black teeth; palpi and the middle and front tarsi brownish. Wings hyaline, the front wings with a fuscous fascia from the apex of the stigma that reaches two thirds across; its base originates at the base of the marginal cell; the stigma and veins are black; the transverse median nervure is interstitial with basal nervure, the median and submedian cells therefore of an equal length.

Type. — No. 7721, U. S. National Museum.

Manila. Described from one specimen taken by Father W. A. Stanton. The species comes evidently close to *P. veda* Cameron, described from India.

Family XXVIII. VESPIDÆ.

57. **Provespa dorylloides Sauss.** Philippines.
58. **Vespa deusta Lepel.** Bacoor (Dr. P. L. Stangl).
59. **Vespa luctuosa Sauss.** Bacoor (Dr. P. L. Stangl).
60. **Vespa nigripennis Sauss.** Philippines.
61. **Vespa philippinensis Sauss.** Balinag, P. I. (A. P. Ashby).

Fr. Casto de Elera records *V. vulgaris* Fabr. and *V. crabro* Fabr., in his "Catalogo de toda la Filipinas."

62. **Polistes chinensis Fabr.**
63. **Polistes dubius Sauss.** Manila (Father W. A. Stanton).
64. **Polistes hebræus Fabr.** Philippine Islands.
65. **Polistes manillensis Sauss.** Manila.

This, according to Saussure, is the smallest *Polistes* known.

66. **Polistes philippinensis Sauss.** Philippine Islands.

The European *P. gallica* Fabr. is included by Fr. Casto de Elera, probably correctly as I have it from Japan.

67. **Icaria philippinensis Sauss.** Bay Laguna (Dr. P. L. Stangl).

Family XXIX. EUMENIDÆ.

68. **Eumenes conica Fabr.** Luzon.
69. **Eumenes curvata Sauss.** Manila (Father W. A. Stanton).
70. **Eumenes gracilis Sauss.** Manila (Father W. A. Stanton).
71. **Eumenes fuleipennis Smith.** Manila (Father W. A. Stanton).
72. **Rhynchium atrum Sauss.** Manila (Father W. A. Stanton).
73. **Lionotus dyscherus Sauss.** Manila.
74. **Lionotus punctum Sauss.** Manila.
75. **Odynerus bizonatus Boisd.** Manila.

Family XXX. MASARIDÆ.

None recorded from the Philippines.

Family XXXI. CHRYSIDIDÆ.

76. **Stilbum amythystina Fabr.** Manila (Father W. A. Stanton); San Rafael (A. P. Ashby); Bacoor (Dr. P. L. Stangl).
77. **Chrysis fuscipennis Brullé.** Manila.
78. **Trichrysis aspera Brullé.** Philippine Islands.

Family XXXII. BETHYLIDÆ.

This family should be well represented in the Philippines.

Family XXXIII. TRIGONALIDÆ.

79. **Trigonalys lachrymosa Westw.** Mindanao.

Family XXXIV. SAPYGIDÆ.

Not yet known from the Philippines.

Family XXXV. MYZINIDÆ.

Some of the East Indian species will be found in the Philippines.

Family XXXVI. SCOLIIDÆ.

80. **Discolia aureipennis Lepel.** Philippines.
81. **Discolia erratica Smith.** Manila.
82. **Discolia modesta Smith.** Manila.
83. **Scolia capitata Guér.** Manila (Father W. A. Stanton).
84. **Scolia procera Illiger.** Manila (Geo. C. Lewis).
85. **Scolia whiteheadii Bingh.** Luzon.
86. **Scolia manilæ, new species.**

♀. Length 9 mm. Black and shining, with rather coarse sparse punctures, clothed with long glittering white hairs, the face on each side below the antennæ with a dense silvery white pubescence; abdominal segments 1 to 3 with yellow bands at apex, that on the first dilated laterally; the second segment has also a large irregularly quadrate yellow spot on each side that is connected with the apical band; the third segment has an oblique yellow line on each side that extends into the apical band; ventral segments 2 to 4 fringed with long white hairs at apex; wings subhyaline, the costal and marginal cells tinged with yellowish; marginal cell squarely truncate at apex; cubital cells two, the second triangular; discoidal cells *two* only, thus differing from typical forms placed here.

Type. — No. 7722, U. S. National Museum.

Manila. Described from two specimens collected by Father W. A. Stanton.

87. **Liacos analis Fabr.** Manila.
88. **Elis annulata Fabr.** Philippines.
89. **Elis aureicollis Smith.** Philippines.
90. **Elis aurulenta Smith.** Philippines.
91. **Elis grossa Fabr.** Philippines.
92. **Elis luctuosa Smith.** Manila.
93. **Elis lindenii Lepel.** Philippines.

Family XXXVII. TIPHIIDÆ.

94. **Tiphia compressa Smith.** Manila.

Family XXXVIII. COSILIDÆ.

None.

Family XXXIX. RHOPALOSOMIDÆ.

None.

Family XL. THYNNIDÆ.

Should have some representatives.

Family XLI. MYRMOSIDÆ.

Probably some of the East Indian species will be found in the Philippines.

Family XLII. MUTILLIDÆ.

95. **Mutilla philippinensis Smith.** Philippine Islands.
96. **Mutilla maculofasciata Sauss.** Luzon.
97. **Mutilla nigra Smith.** Luzon.
98. **Mutilla suspiciosa Smith.** Luzon.

Superfamily IV. *FORMICOIDEA*.

Family XLIII. DORYLIDÆ.

No species is yet recorded.

Family XLIV. PONERIDÆ.

99. **Diacamma versicolor Smith.** Philippine Islands.

100. **Odontoponera denticulata Smith.** Mindoro, Naujan, Samar.

Family XLV. ODONTOMACHIDÆ.

101. **Odontomachus infandus Smith.** Manila.

Family XLVI. MYRMICIDÆ.

102. **Sima allaborans Walker.** Manila.

103. **Pheidologiton diversus Jerdon.** Philippines.

104. **Plagiolepis longipes Jerdon.** Luzon, Bataan, Manila, Orion.

105. **Tetramorium guinense Fabr.** Luzon, Bulacan, Lolomboy.

Family XLVII. CRYPTOCERIDÆ.

I have a species of this family not yet identified.

Family XLVIII. DOLICHODERIDÆ.

106. **Dolichpoderus bituberculata Mayr.** Luzon, Manila, Navotas.

107. **Technomyrmex albipes Smith.** Luzon, Cavite, Santa Cruz, Navic.

Family XLIX. FORMICIDÆ.

108. **Camponotus cinerascens Fabr.** Luzon, Laguna, Los Baños, Calaanba.

109. **Camponotus gigas Latr.** Luzon, Manila, Cavite, Santa Cruz.

110. **Camponotus pallidus Smith.** Luzon, Mindanao, Bataan, Orion.

111. **Formica quadrisecta Smith.** Manila.

112. **Formica ruba Fabr.** Luzon, Manila.

113. **Polyrhacis aciculata Smith.** Philippines.

114. **Polyrhacis abdominalis Smith.** Luzon, Orion, Cavite, Santa Cruz, Samar, Paramas.

115. **Polyrhacis armata Le Guillon.** Luzon, Manila, Navotas, Laguna, Colamba.

116. **Polyrhacis bellicosa Smith.** Luzon, Manila, Navotas.

117. **Polyrhacis bicolor Smith.** Luzon, Manila, Ternate.

118. **Polyrhacis bihamata Drury.** Luzon, Manila, Navotas, Bataan, Orion.

119. **Polyrhacis cyaniventris Smith.** Manila.

120. **Polyrhacis dives Smith.** Luzon.

121. **Polyrhacis maligna Smith.** Manila.

122. **Polyrhachis mayri Roger.** Luzon, Manila, Navotas, Laguna, Los Baños.

123. **Polyrhachis philippinensis Smith.** Manila (W. A. Stanton, collector).

124. **Polyrhachis rastellata Latr.** Paragua, Prov. Princesa, Calamianes, Culion.

125. **Polyrhachis sexspinosa Latreille.** Luzon.

The National Museum has quite a collection of ants from the Philippines, but as yet it has been studied only generically; there are several genera represented not yet noted from these Islands.

Superfamily V. *PROCTOTRYPOIDEA.*

Family L. PELECINIDÆ.

None.

Family LI. HELORIDÆ.

None.

Family LII. PROCTOTRYPIDÆ.

Should occur.

Family LIII. BELYTIDÆ.

This family ought to be well represented.

Family LIV. DIAPRIIDÆ.

Undoubtedly plentifully represented.

Family LV. CERAPHRONIDÆ.

Should be well represented.

Family LVI. SCELIONIDÆ.

126. **Hadronotus philippinensis, new species.**

♀. Length 1.3 mm. Black, closely punctate, opaque, the thorax clothed with a fine pubescence; scape, pedicel beneath and at apex, and the legs, light brownish-yellow; funicle brown; club black; mandibles except the teeth yellowish; palpi pale or whitish; wings hyaline, pubescent, the veins brown. The abdomen is opaque, punctate, the first segment about as long as the second, delicately striate, with a narrow depression at apex, the following segments short. The pedicel is obconical, a little longer than the first joint of the funicle, funicle joints 2 and 3 not longer than thick, the others transverse, the club is large, fusiform.

Type. — No. 7718, U. S. National Museum.

Manila. Described from three specimens received from Father W. A. Stanton.

Family LVII. PLATYGASTERIDÆ.

Ought to be well represented.

Superfamily VI. *CYNIPOIDEA.*

Family LVIII. FIGITIDÆ.

127. **Loboscelidia rufescens Westw.** Sulu Island.

Family LIX. CYNIPIDÆ.

Should be plentifully represented.

Superfamily VII. *CHALCIDOIDEA.*

Family LX. AGAONIDÆ.

When the fig trees of the Philippines are studied, this family will be found to have many representatives, and probably most of the species described from Java will be found in the Archipelago.

Family LXI. TORYMIDÆ.

This family also should be abundantly represented.

Family LXII. CHALCIDIDÆ.

128. **Leucospis regalis Westw.** Luzon, Camiguin.

129. **Chalcis albotibialis, new species.**

♀ ♂. Length 4 to 5 mm. Black, the head and thorax closely punctate, with a sparse whitish pubescence, the metathorax coarsely reticulated; tegulæ, tips of front and middle femora, their tibiæ and tarsi entirely, hind tibiæ outwardly, except at extreme base, and their tarsi yellowish-white, hind femora with a yellow spot at apex above, beneath they are armed with numerous minute teeth. Wings hyaline, the veins brown-black.

Type. — No. 7695, U. S. National Museum.

Manila. Numerous specimens bred by Father W. A. Stanton from a Lepidopteron.

130. **Chalcis argentifrons, new species.**

♀. Length 3.5 to 3.6 mm. Black and shining, the head and thorax, sparsely minutely punctate, with a sparse whitish pubescence, the metathorax coarsely reticulated, the face anteriorly with a dense silvery white pubescence; tegulæ waxy-white; tips of front and middle femora, their tibiæ and tarsi, and the hind tibiæ and tarsi, yellowish-white; last joint of all trochanters yellowish; hind femora reddish, with a dusky or blackish spot outwardly a little beyond the middle, and with their apices yellow *above*. Wings hyaline, the veins brown-black. The abdomen is subglobose,

shining, but the segments are very minutely shagreened, the sides clothed with a whitish pubescence.

Type. — No. 7696, U. S. National Museum.

Manila. Described from 5 specimens bred by Father W. A. Stanton from a Lepidopteron.

131. **Chalcis pulchripes Holmgr.** Manila.

132. **Haltichella nasuta Holmgr.** Manila.

133. **Haltichella ludlowæ, new species.**

♂. Length 2.5 mm. Black, the head and thorax closely punctate, opaque, the abdomen smooth and highly polished, the petiole very short, the second segment occupying nearly the whole of the basal half of the abdomen; ocelli red; second joint of front and middle trochanters, extreme tips of their tibiæ and all tarsi yellowish-white; wings hyaline, the veins brown, the epitegulæ testaceous, the tegulæ black; hind femora much swollen, minutely denticulate beneath the hind tibiæ at base with a pale annulus, where they unite with the femora.

Type. — No. 7697, U. S. National Museum.

Balaan, Luzon. Described from a single specimen taken by Miss C. S. Ludlow.

134. **Haltichella validicornis Holmgr.** This species was originally described from Java, but it has also been taken at Balaan, Luzon, by Miss Ludlow.

135. **Neochalcis tarsalis Walk.** Philippine Islands. Balaan, Luzon (Miss Ludlow).

136. **Dirhinus anthracia Walk.** Philippine Islands.

Family LXIII. EURYTOMIDÆ.

137. **Eurytoma manilensis, new species.**

♀. Length 2 mm. Black, umbilicately punctate; scape and legs reddish-yellow, the tarsi paler, or pale yellowish; pedicel and flagellum brown, the pedicel minute, rounded; first joint of flagellum about one and one half times as long as thick and the longest joint, the following joints suboval, very little longer than thick. Wings hyaline, the veins pale yellowish-white; the marginal vein is a little longer than the stigmal. The abdomen is conic-ovate, subsessile, compressed, smooth and shining, pointed at apex.

♂. Length 1.4 to 1.5 mm. Agrees well with the female in color but differs in antennal and abdominal characters: the flagellum is long, the funicle joints long, pedicellate at apex, the thickened posteriorly portion with whorls or rather long hairs but the hairs are, however, shorter than the joints; the abdomen is longly petiolated, the petiole being as long as the hind coxæ, and cylindrical, smooth and shining, the body of the abdomen is small, seen from the side, triangular in outline, and subcompressed.

Type. — No. 7719, U. S. National Museum.

Manila. Described from one ♀ and two ♂ specimens collected by Father W. A. Stanton.

Family LXIV. PERILAMPIDÆ.

No species known.

Family LXV. EUCHARIDÆ.

138. **Chalcura (Eucharis) ægineta Walk.** Philippines.

139. **Chalcura (Thoracantha) nasua Walk.** Philippines.

Family LXVI. MISCOGASTERIDÆ.

This family should be well represented in the Philippines.

Family LXVII. CLEONYMIDÆ.

140. **Epistenia ania Walk.** Philippines.

141. **Epistenia Feretius Walk.** Philippines.

Family LXVIII. ENCYRTIDÆ.

142. **Metapelma gloriosa Westw.** Luzon, Camiguin.

143. **Calosoter anemetus Walk.** Philippines.

144. **Anastatus stantoni, new species.**

♀. Length about 3.5 mm. Blue to blue-green, the head in front and on the vertex gold-green, the middle mesothoracic lobe and the lateral lobes *within* metallic bronze-green; abdomen spatulate black or purplish-black with a white transverse band at apex of the first segment; antennæ, except the scape, black, the scape rufous; legs black, the middle and hind trochanters annulated with white or yellowish-white, the front and hind tarsi, from the basal joint, more or less brownish. Wings with the apical two thirds fuscous, the basal third and a narrow transverse band in the fuscous portion from before the stigmal vein, clear hyaline.

Type. — No. 7698, U. S. National Museum.

Manila. Described from two specimens collected by Father W. A. Stanton.

145. **Coccidencyrtus manilæ, new species.**

♀. Length 7.5 to 8 mm. Coal black, the disk of the mesonotum with a slight æneous tinge; mandibles and palpi yellowish; antennæ brown, the scape black, the pedicel at extreme apex yellowish; funicle joints 1 to 6 transverse-moniliform, gradually increasing in size, the club rather large, two thirds the length of the funicle, 3-jointed; pedicel obconical, about thrice as long as thick at apex; legs black, with the front and middle tibiæ and tarsi, a narrow annulus at base of hind tibiæ and the hind tarsi, pale yellowish. Wings hyaline, the thick marginal vein and the short stigmal vein brown-black.

Type. — No. 7699, U. S. National Museum.

Manila. Described from seven specimens received from Father W. A. Stanton.

146. **Aphidencyrtus pallidipes, new species.**

♀. Length 0.8 mm. Æneous black, the abdomen, above, with a greenish, metallic luster; antennæ light brown, the flagellum thickened towards apex, pubescent; legs, including coxæ, pale yellowish, the femora and tibiæ toward apex faintly brownish. Wings hyaline, the marginal and stigmal veins brown.

Type. — No. 7701, U. S. National Museum.

Manila. Described from two specimens bred by Father W. A. Stanton from an undetermined Aphid.

Exoristobia, new genus.

Allied to *Tachinæphagus* Ashm., but with the post-marginal vein much longer, the stigmal vein slightly curved upwards, the club of the antennæ much larger, as long as the funicle, while the funicle joints are transverse.

147. **Exoristobia philippinensis, new species.**

♀. Length 1 to 1.1. Robust, sparsely, minutely punctate, the head dark blue, the scrobes deeply impressed, metallic green at bottom, the thorax black, with a faint bluish and bronzy tinge in certain lights, the abdomen æneous black; scape brownish-yellow towards tip beneath; flagellum strongly clavate, the funicle joints very short, transverse, the club very large, dilated, as long as the funicle; legs black, with the tibiæ ferruginous, the middle tibiæ toward apex, tibial spurs, and all tarsi, yellowish-white. Wings hyaline, the marginal and stigmal veins dark brown, the stigmal vein slight curved.

Type. — No. 7700, U. S. National Museum.

Manila. Described from five specimens bred by Father W. A. Stanton from a dipterous larva, *Exorista dispar* Macq.

Family LXIX. PTEROMALIDÆ.

None.

Family LXX. ELASMIDÆ.

None.

Family LXXI. EULOPHIDÆ.

148. **Tetrastichus philippinensis, new species.**

♀. Length 1.6 to 1.8 mm. Dark metallic greenish-blue, the head in front and the abdomen more decidedly bluish; the mesonotum is smooth and impunctate, except some sparse punctures on the middle lobe along the parapsidal furrows; scape, pedicel and legs, except the coxæ, brownish-yellow, the tarsi, except the last joint, yellowish-white; abdomen ovate, shorter than the head and thorax united.

Type. — No. 7702, U. S. National Museum.

Manila. Described from 25 specimens bred by Father W. A. Stanton, from his No. 37, not yet determined.

149. **Euplectrus manilæ, new species.**

♀. Length 1.5 mm. Head and thorax black, shining, with some long, sparse hairs, the mesonotum posteriorly delicately shagreened, but without a median carina posteriorly; mouth parts, scape, pedicel, legs, including coxæ, and the abdomen beneath and a large spot on disk above, yellowish-white, rest of antennæ light brown, the club darker, the petiole of the abdomen and the body of abdomen at the sides and apex black. Wings hyaline, the veins pale or yellowish.

Type. — No. 7703, U. S. National Museum.

Manila. Described from 5 specimens bred by Father W. A. Stanton from his No. 35, *Papilio alphenor* Cram., as identified by Dr. Dyar.

150. **Euplectrus philippinensis, new species.**

♀. Length 1.5 mm. Brownish-yellow, with sparse long hairs, the eyes, the flagellum, and two or three streaks on dorsum of abdomen brown or brown-black; legs yellowish or waxy-white; wings hyaline, the veins pale yellowish.

The brown-black flagellum is pubescent, slightly thickened towards apex, joints 1 and 2 about twice as long as thick, the following a little shorter but thicker. The head is polished, impunctate, while the thorax, except at sides and the metathorax which are smooth, is delicately shagreened.

Type. — No. 7704, U. S. National Museum.

Manila. Described from 3 specimens bred by Father W. A. Stanton from a slug caterpillar.

Family LXXII. TRICHOGRAMMIDÆ.

These are all egg parasites and undoubtedly many will be found in the Philippines.

Family LXXIII. MYMARIDÆ.

This family also will be found plentifully represented.

Superfamily VIII. *ICHNEUMONOIDEA*.

Family LXXIV. EVANIIDÆ.

151. **Evania appendigaster Linné.** Manila (W. A. Stanton collector).

152. **Evania impressa Schlett.** Manila.

153. **Evania verrucosa Schlett.** Bohol.

Family LXXV. AGRIOTYPIDÆ.

Representatives should be sought for in the mountain streams in the interior.

Family LXXVI. ICHNEUMONIDÆ.

154. **Cryptus vesticalis Bingham.** Luzon.

155. **Cryptus præpes Bingh.** Luzon.

156. **Caryphus apicalis Holmgr.**

157. **Mesostenoideus philippinensis, new species.**

♀. Length 14.5 mm.; ovipositor a little shorter than the abdomen. Black, marked with white as follows: upper orbits, face below the antennæ, the clypeus, mandibles, except the apical two thirds, the cheeks, hind orbits, a line on each side of pronotum above and beneath, the scutellum, except at base, the scutellar ridges, the tegulæ, a line beneath, a band on the middle of the mesopleura, the mesosternum, a /\-shaped mark on the metathorax, a spot on the mesopleura, bands at the apex of abdominal segments, those of the 4th, 5th and 6th interrupted medially, and legs mostly yellow; the first joint of the middle trochanters basally, the middle femora above and their tibiæ and tarsi above, a spot at apex of hind coxæ, base of their trochanters, a line on the hind femora *above*, their apices, a line on hind tibiæ in front and behind, their apices, and the fifth joint of their tarsi, all black, rest of hind tarsi yellowish-white; antennæ black, with joints 8 to 13 white.

Type. — No. 7705, U. S. National Museum.

Manila. Described from a single specimen taken by Father W. A. Stanton.

158. **Mesostenoideus literatus Brullé.** Philippines.

159. **Mesostenoideus marginatus Brullé.** Philippines.

Fr. Castro de Elera in his "Catalogo de toda la Fauna Filipinas" has incorrectedly included *Mesostenus literalis* Brullé, a species described from Cuba.

160. **Pimpla punctum Brullé.** Manila.

Fr. Castro de Elera, in his "Catalogo de toda la Fauna Filipinas," has included *Pimpla instigator* Linné, evidently through an error. He records also *Xylonomus irragator* Fabr., a European species as found in the Philippines, but gives no data. Another species mentioned by him, *Ammophia subulosa* Fabr., I cannot find mentioned in any European work, treating on the *Ichneumonidæ*, nor can I find where this genus was described.

161. **Enicospilus ashbyi, new species.**

♂. Length 18.5 mm. Luteous, the abdomen, except the basal two thirds of the petiole which is white, honey-yellow; eyes black; antennæ reddish-brown; legs yellowish-brown, the coxæ, trochanters, and base of femora luteous; wings hyaline, the veins brown-black, the stigma, base of the radius and the two spots in the marginal cell, the first being rather large and triangular, the second very small, honey-yellow.

Type. — No. 7706, U. S. National Museum.

Bilinag, P. I. Described from a single specimen received from Mr. A. P. Ashby.

162. **Leptopygus stangli, new species.**

♀. Length 9 mm.; ovipositor less than half the length of the abdomen. Black, very minutely punctate, sericeous; the temples, the cheeks, the face below the insertion of the antennæ, the scape and pedicel of the antennæ, and bands at the apex of abdominal segments 3–6 testaceous; flagellum black, brownish beneath; palpi, all coxæ and trochanters, except the hind coxæ at base, front tibiæ toward base and the front and middle tarsi, whitish; rest of legs, except the hind tibiæ which are black or brown-black and their tarsi which are also more or less fuscous or dark brown, red, the tibial spurs white. Wings hyaline, the veins brown-black, the stigma reddish-brown. The metathorax is long, areolated, the areola being twice as long as the petiolar area. The abdomen is fully twice as long as the head and thorax united, compressed, the ovipositor black, not quite half as long as the abdomen.

Type. — No. 7707, U. S. National Museum.

Bacoor, P. I. Described from 3 specimens received from Dr. L. P. Stangl.

163. **Temelucha philippinensis, new species.**

♀. Length 8 mm.; ovipositor not quite the length of the abdomen. Brownish-yellow; a spot on vertex enclosing the ocelli, the abdominal petiole at base, a spot at base of abdominal segments 2 and 3 above, and the ovipositor, black; eyes brown; antennæ basally and beneath light brownish, becoming blackish toward apex. Wings hyaline, the stigma brown, the other veins darker. The abdomen is nearly thrice as long as the head and thorax united, and strongly compressed.

Type. — No. 7708, U. S. National Museum.

Bacoor, P. I. Described from 3 specimens collected by Dr. P. L. Stangl.

Family LXXVIII. BRACONIDÆ.

164. **Bracon deceptor Smith.** Luzon.

165. **Bracon luteifrons Brullé.** Manila.

166. **Bracon nigrifrons Brullé.** Manila.

167. **Meteorus bacoorensis, new species.**

♀. Length 5 mm. Brownish-yellow, the eyes black with a slight purplish tinge, the legs basally on coxæ, trochanters and base of femora, tinged with whitish; sheaths of ovipositor black. Wings hyaline, the stigma, costæ, basal vein, cubitus, and the transverse cubiti, yellow; the recurrent nervure is interstitial with the first transverse cubitus. The first three or four joints of the flagellum are long, about four times as long as thick.

Type. — No. 7709, U. S. National Museum.

Bacoor, P. I. Described from a single specimen received from Dr. P. L. Stangl.

168. **Phanerotoma philippinensis, new species.**

♀. Length 3.5 mm. Uniformly brownish-yellow, but the abdomen with the venter whitish and giving a whitish tinge to the first and second dorsal segments; eyes black; antennæ dusky at tips where they taper off; legs yellowish-white, the hind tibiæ at apex and their tarsi toward apex fuscous. Wings hyaline, the parastigma, the stigma, the nervures forming the second cubital and the marginal cells, and the median vein beyond the basal nervure, all brown.

Type. — No. 7710, U. S. National Museum.

Bacoor, P. I. Described from a single specimen received from Dr. P. L. Stangl.

169. **Apanteles philippinensis, new species.**

♀. Length 1.7 to 1.8 mm. Black, shining, the thorax delicately punctulate, the plate of the first abdominal segment linear, impunctate; palpi white; legs brownish-yellow, the hind-legs, except the basal two thirds of the tibiæ and base of tarsi, black or dark fuscous; ventral segments 1 to 3 yellowish. Wings hyaline, the stigmal and subcostal vein dark brown, the internal veins pale.

Type. — No. 7711, U. S. National Museum.

Manila. Described from 8 specimens received from Father W. A. Stanton.

170. **Apanteles manilæ, new species.**

♀. Length 1.5 to 1.6 mm. Black, the head smooth, impunctate, the thorax delicately, closely punctate, the first and second segments of the abdomen sculptured, the following smooth and shining, the third being as long as the second; palpi white; antennæ wholly black; legs reddish-yellow, the apices of the hind femora and tibiæ, and the middle and the hind tarsi, fuscous or blackish. Wings hyaline, the stigma brown.

Type. — No. 7712, U. S. National Museum.

Manila. Described from 8 specimens received from Father W. A. Stanton.

171. **Urogaster philippinensis, new species.**

♀. Length 1.8 mm.; ovipositor about as long as the hind femur. Black, the thorax minutely punctured, the plate of the first abdominal segment sculptured, the rest of the abdomen smooth, shining; legs reddish-brown, the coxæ, trochanters and base of the femora of the front and middle legs and the hind legs entirely, except basal two thirds of tibiæ and an annulus at base of tarsi, black or very dark fuscous; tibial spurs white. Wings hyaline, the stigma and costæ brown, the internal veins pale.

Type. — No. 7713, U. S. National Museum.

Manila. Described from 3 specimens received from Father W. A. Stanton.

172. **Urogaster stantoni, new species.**

♀. Length 1.6 to 1.8 mm.; ovipositor about the length of the abdomen. Black, the thorax closely, minutely punctate, the head smooth, impunctate, the plate of the first abdominal segment, quadrate, distinctly sculptured; scape yellowish, rest of the antennæ black; palpi white; legs reddish, the coxæ black, the tip of the hind tibiæ and the hind tarsi, except the joints basally, fuscous. Wings hyaline, the stigma black or brown-black.

Type. — No. 7714, U. S. National Museum.

Manila. Described from 14 specimens, received from Father W. A. Stanton, bred from a caterpillar labelled E.

173. **Microplitis manilæ, new species.**

♀. Length 2 mm. Black, the head smooth, the thorax closely punctulate, sericeous, the metathorax finely rugulose, with a median carina, the plate of the first abdominal segment linear, punctate, the rest of the segments smooth, shining, the basal two ventral segments and the sides of the first and second dorsal segments testaceous; palpi yellowish; legs reddish, the coxæ, trochanters, base of femora and the hind legs entirely, except an annulus on tibiæ and the tibial spurs which are white, black; the front and middle tarsi are fuscous. Wings fuscous, the stigma and costæ dark brown.

♂. Length hardly 2 mm. Differs from the ♀ in having the front and middle femora pale at base, not black, the basal half or more of the hind tibiæ white, while the abdomen is shorter, the antennæ longer.

Type. — No. 7715, U. S. National Museum.

Manila. Described from 2 specimens received from Father W. A. Stanton.

174. **Microplitis philippinensis, new species.**

♂. Length 4.5 mm. Black; face in front finely closely punctate, opaque, the thorax above shining, but minutely punctured, the metathorax very coarsely reticulated, with a sharp median carina; palpi, yellowish; legs black or fuscous, the front femora at apex and beneath, their tibiæ and tarsi, and other legs from tip of femora, are yellowish; the hind tibiæ are very stout and are more or less brownish or reddish outwardly from the middle to near the base. Wings with the apical third fuscous, the basal two thirds subhyaline, the stigma and veins black.

Type. — No. 7716, U. S. National Museum.

Manila. Described from two specimens (B) and (F) received from Father W. A. Stanton.

175. **Monolexis manilensis, new species.**

♀. Length 2.5 mm.; ovipositor a little longer than the abdomen. Honey-yellow, smooth and shining, the metathorax feebly rugulose, the mesonotum trilobed, the middle lobe posteriorly depressed and shagreened; legs pale yellowish-white, the tarsi pale. Wings hyaline, the veins pallid, the stigma light brown or testaceous. Abdomen oblong oval, the first segment sculptured, feebly striated, the other segment smooth, impunctate.

♂. Length 0.8 to 1 mm. Agrees well with the female except in being smaller, with the antennæ very long, slender, brown-black, and in having the abdomen much shorter, more narrowed basally, and without the prominent ovipositor.

Type.—No. 7717, U. S. National Museum.

Manila. Described from nine specimens bred by Father W. A. Stanton from a Scolytid.

Family LXXIX. STEPHANIDÆ.

176. **Stephanus coronator Fabr.** Luzon.
177. **Stephanus nigricaudus Sichel.** Manila.
178. **Stephanus sulcifrons Schlett.** Philippines.
179. **Stephanus tarsatus Schlett.** Philippines.
180. **Stephanus unicolor Schlett.** Philippines.

Suborder II. PHYTOPHAGA.

Superfamily IX. *SIRICOIDEA.*

Family LXXX. ORYSSIDÆ.

181. **Oryssus maculipennis Westw.** Mindanao.

Family LXXXI. SIRICIDÆ.

182. **Tremex rugicollis Westw.** Luzon.

Family LXXXII. XIPHYDRIIDÆ.

Should occur in the Islands.

Family LXXXIII. CEPHIDÆ.

Species in this family ought to be found.

Superfamily X. *TENTHREDINOIDEA.*

Family LXXXIV. XYELIDÆ.

Not known from the islands.

Family LXXXV. LYDIDÆ.

Unknown.

Family LXXXVI. HYLOTOMIDÆ.

Should be well represented.

Family LXXXVII. LOPHYRIDÆ.

Not yet recorded from the archipelago.

Family LXXXVIII. PERRYIIDÆ.

Some representatives should be found.

Family LXXXIX. PTERYGOPHORIDÆ.

Well represented in Australia and some forms should occur in the Philippines.

Family XC. SELANDRIIDÆ.

183. **Senoclia albocœrulea Bingh.** Luzon.

This family should have many representatives.

Family XCII. DINEURIDÆ.

Probably not found in the Archipelago.

Family XCIII. TENTHREDINIDÆ.

Fr. Castro de Elera, in his "Catalogo de toda la Fauna Filipinas" includes *Tenthredo variabilis* Kl., *T. neglecta* Kl., and *Dolerus niger* Kl., but gives no definite records.

Family XCIV. CIMBICIDÆ.

I see no reason why this family should not be represented in the islands.

NOTES ON OSMIINÆ WITH DESCRIPTIONS OF NEW GENERA AND SPECIES.

By E. S. G. Titus,

Washington, D. C.

Genus ROBERTSONELLA Titus, 1904.

Robertsonella, new genus.

Slender, black, somewhat resembling *Chelostoma* (?) *campanularum* Kirby; clypeus truncate, broad in female, *mandibles tridentate in females*, sharply *bidentate in male*, malar space absent; antennæ normal in both sexes; labial palpi four-jointed, first joint not quite one half as long as second, third and fourth short, lateral, third slightly the broader and longer; *maxillary palpi four-jointed*, first and second equal and longest, fourth shorter, third nearly equal to fourth and over two thirds as long as first, fourth joint distinctly tapering to a rounded point; median nervure interstitial or at most received very slightly before origin of basal nervure, first submarginal cell longer than second, second narrowed one half above; claws cleft in male, simple in female; first dorsal abdominal segment rounded, with a narrow sulcus, male

with last dorsal segment (7), rounded, entire, with a faint trace of lateral angles, first ventral segment with a slight transverse swelling, second and third broad, second with lateral marginal swellings, third sinuate marginally, sides of abdomen very parallel.

Type of genus the following species:

Robertsonella gleasoni, new species.

♀. Length 5.5 mm. Black, shining, finely and rather coarsely punctured; pubescence glistening silvery white, short and not thick on face, cheeks and mandibles with a fringe of longer hairs, sparse on thorax above, denser and longer on pleura, very short and sparse on abdomen, segments 1 to 5 with a narrow appressed apical fringe, interrupted (or rubbed), on segments 1 and 2, sixth segment densely clothed with short suberect hairs, ventral scopa dense and white, extending well up along sides of abdomen; femora and tibia with sparse white hair and tarsi with dense slightly embrowned pubescence beneath on first joint, remaining joints moderately pubescent; tibial spurs pale; middle tibia not as long as first joint of corresponding tarsi.

♂. Length 5 to 5.5 mm. Closely resembles female; punctures of head finer and closer, pubesence of face white, dense, appressed, that of clypeus long, very dense and snowy-white, slightly discolored at apical margin, hair fringing cheeks and mandibles longer and moderately dense; antennæ reaching beyond tegulæ; scutellum and metathorax with more pubescence than in female, abdominal segments 1 to 3 fasciate only at sides, 4 to 6 fasciate, fourth with white pubescence on disc; seventh segment slightly flattened, apex of sixth slightly reflexed; third ventral with a median apical patch of white hair.

Several specimens on *Phacelia purshii* at Grand Tower, Illinois, 9 May, 1902, by H. A. Gleason. 1 ♀ and 1 ♂ deposited in U. S. National Museum.

Type.—No. 6858.

Genus HERIADES Spinola, 1808.

Type: *Heriades truncorum* (Linné) 1758.

So far as I have been able to find, Spinola designated no species as the type of his genus; however, in 1810, Latreille distinctly designates the above species as the type of *Heriades* (Consid. Gen. sur l'Ordre Naturel des Animaux, p. 439). Schenck in 1859 created for *H. truncorum* the genus *Trypetes*. This generic name was not admissible, since in 1836 Schönherr had used it for a coleopterous genus.

Hence Robertson's Trypetini and Trypetoidea will not stand and, for the tribal name, I propose *Heriadini*.

Our *Heriades carinatum* Cresson is congeneric with *H. truncorum* Linné, as also is the following species.

Heriades bruneri, new species.

♀. Length 6.5 mm. Shining black, pubescence of head and thorax pure white, of abdomen and tarsi yellowish. Head and thorax coarsely confluently punctured, punctures on disc of thorax sometimes separate, on clypeus not so coarse as on rest of head. Occiput (except hind margin), middle of face, clypeus, mandibles and disc of thorax with sparse pubescence. Head not so broad as thorax, face narrower than in *H. carinatum*. Antennæ short, black, slightly embrowned beneath; clypeus with a shallow central marginal concavity from which there projects a minute blunt central tooth and two smaller lateral teeth, outside of each of these latter, on the clypeal margin, is another minute tooth; labrum elongate, punctured, rounded at tip; mandibles broad at apex, with no "submedian dentiform angle," simple at base, tridentate, outer tooth sharp, slightly reddish, other teeth short, blunt, scarcely separable, cheeks fringed with white pubescence; maxillary palpi three-jointed, joints almost as in *H. truncorum* L.; labial palpi four-jointed, first as long as second; third and fourth short, subequal. Tegulæ polished, minutely punctured, wings very dark, veins black. Legs black, femora and tibiæ clothed with sparse white pubescence, hairs on tarsi quite bristly. Abdominal punctures fine, close, but separate, pubescence on hind margins of all segments, thin on 1–3, becoming denser successively on 4–6, these latter segments, especially 5 and 6, having short fulvous-yellow hairs on disc. Ventral scopa long and richly yellow.

♂. Length 6 mm. Closely resembles the female. Mandibles narrower at tip, outer tooth sharp; occiput smooth and shining at sides, antennæ reaching almost to tegulæ, pubescence of clypeus and fringe on cheeks denser and white, sparse on remainder of head and on thorax; tegulæ paler than in female; pubescence on hind margins of first two dorsal abdominal segments whitish, on segments 3–5 yellowish, hind margin of sixth segment bare, evenly rounded at apex. A slight enlargement of first ventral segment may be seen, but it is not sufficiently developed to call a tooth, first two ventral segments coarsely punctured.

Three ♀ at Juan Vinas, Costa Rica, 2 March, 1902, and one ♂ at Monte Redondo, Costa Rica, 3 March, 1902, by Prof. Lawrence Bruner. One ♀ and one ♂ deposited in the U. S. National Museum.

Type. — No. 6857.

Genus PROCHELOSTOMA Robt., 1903.

Prochelostoma philadelphi Rob.

I have examined a number of specimens of this species from Columbus, Ohio, collected May 24, 25, 28 and 29, 1902, by J. C. Bridwell.

The spurs on the middle and hind tibiæ are distinctly serrated, on the hind tibiæ one being short and sickle-shaped, the other long and more coarsely serrated. The middle tibia has a distinct prominent tooth on the outer side at the apex. Maxillary palpi short, first joint globular, second stout, about as long as fourth, third shorter than second, about as long as first, third and fourth slender, fourth tapering, somewhat finger-shaped.

Genus PROTERIADES Titus, 1904.

Proteriades, new genus.

Type: *Heriades semirubra* Ckll. 1898. Trans. Amer. Entom. Soc. XXV, p. 198, ♂.

Mandibles bidentate, inner tooth the shorter, teeth of equal length; labrum elongate, polished, slightly convex, truncate at apex, sides parallel, ferruginous; clypeus at apex with a narrow polished edge, faintly curved, slightly convex and with a minute polished tooth in the center; scape of antenna slightly swollen and deeply punctured; head shaped as in *Ashmeadiella bucconis* (Say), as broad as thorax, "ocelli in a triangle"; "facial quadrangle much longer than broad, orbits parallel" (Cockerell, *l. c.*). Maxillary palpi short and stout, *four-jointed*, first and third joints equal, second one half longer than first, fourth more slender than others, slightly shorter than third, first joint subglobose, third scarcely as wide as second; blade of maxilla rounded at apex, *outer edge of blade with a row of long spines each hooked at the tip.* Labial palpi short, stout, covered with many short spines, *second joint one and a half times as long as first, third joint short, wide, longitudinally concave, last joint slender, shorter than third and set deeply into the concavity of the third joint.* Marginal cell about as long as first discoidal, apex not attaining the margin, stigma small, second submarginal shorter than first, strongly narrowed above, transverse median nervure received before origin of basal nervure. Abdomen shaped as in other *Heriadini*, sixth segment with a short tooth on each side, apical segment deeply foveolate above, broadly truncate, with a central apical emargination, second ventral segment with a small transverse swelling, ventral segments 3–5 apically emarginate, the fifth quite deeply so and all faintly swollen transversely. *Basal impression of first dorsal segment not bounded by a carina, concavity shallow, broad, impunctate.*

While some of the above characters may later prove to be simply specific it is thought best to give them in detail now.

When Professor Cockerell described this species he stated that it was "by no means a typical *Heriades*, yet it is not an *Ashmeadiella*." The type specimens were from "Southern California, two sent by Mr. Fox." I have before me one specimen taken in Los Angeles Co., Calif., by Mr. D. W. Coquillett. Mr. Fox writes in answer to questions of mine regarding the type at Philadelphia: "Second ventral segment reddish, the third to fifth reddish-fuscous or almost entirely fuscous. Second ventral segment and (especially third to fifth) with a transverse fold or swelling which is emarginate or less prominent medially on segments 3–5. Sixth dorsal dentate laterally. Seventh dorsal foveolate. Seventh at tip agreeing very well with your drawing."

This species although at first sight superficially resembling *Pseudosmia andrenoides* Spinola of Europe is not related to that species. The latter being a true Osmiinæ closely related to *Nothosmia*. I have examined specimens determined by Dr. Schmiedeknecht.

Proteriades may be separated from true *Heriades* by the absence of the superior carina on first dorsal segment; from *Ashmeadiella* by the structure of the last dorsal abdominal segments. The general shape and italicized characters will separate it from other described genera known to me.

One specimen deposited in U. S. National Museum. No. 6855, genus type.

Genus OSMIA Panzer, 1806.

Type. — *Osmia rufa* (Linné) 1758.

This species described by Linné as *Apis rufa*, ♂, and *Apis bicornis* ♀, was designated by Latreille in 1810 (Consid. Gen. sur l'Ordre Nat. Animaux, p. 439) as the type of the genus *Osmia*.

Osmia lignaria Say, *Osmia lignaria*, var *a*, Cockerell, and *Osmia propinqua* Cresson are the only American species I have seen which belong to this genus.

Genus MONUMETHA Cresson, 1864.

Type. — *Monumetha argentifrons* Cresson, 1864.

A character I have not seen mentioned in connection with this genus is the presence in the center of the hind margins of the first and second ventral segments of the ♂ of a sharp slender spine. The type species is very variable in size and in amount of pubescence present. A specimen collected this past summer by Mr. Rolla P. Currie at Kaslo, B. C., has the abdominal fasciæ all present and entire and the disc of the thorax densely covered with pubescence.

Genus ZACESTA Ashmead, 1899.

Type. — *Zacesta rufipes* Ashmead, 1899, ♂.

Described from two specimens taken by Mr. D. W. Coquillett in "Los Angeles Co., Calif." U. S. National Museum, type No. 5257.

I have examined the type specimens and the mouth parts of another specimen of this species taken in the same locality by Mr. Coquillett and find that *it is not a megachilid.* The labial palpi are four-jointed, first three joints nearly equal, the second a trifle the longest; and the fourth joint distinctly shorter than either of the others. Maxillary palpi six-jointed, basal joint shortest, rather stout, fifth slightly longer, very slender, fourth twice as long as first and slender, sixth almost as long as fourth, slender, second and third subequal slightly shorter than sixth and moderately stout. The total length of the maxillary palpus slightly exceeds that of the blade of the

maxilla, which is broad at the base and widely rounded at the apex. The transverse median nervure of the anterior wings enters far before the origin of the basal nervure; marginal cell acuminate, but not sharply so, scarcely attaining the costa at the apex; first cubital cell the longer, second narrowed at least one half above, the second transverse cubitus strongly bent; stigma small, narrow. Second joint of hind tarsi normal, normally inserted on the first; claws cleft; pulvillus present. Abdomen distinctly fasciate; "pygidium triangular, entire, the hypopygium normal" (*Ashm.*). The above characters will I believe separate the genus from any hitherto known and place it, at the same time, in the Panurgidæ.

In *Zacesta rufipes* the mandibles are elongate, pointed sharply, and with a poorly defined tooth set nearly half way back on the inner side; clypeus is yellow on the apical half only, labrum yellow, mandibles yellow at base blending into ferruginous at apices: ocelli in a curve; antennæ longer than head, scape deep brown, flagellum yellowish; tegulæ yellowish, shining, hairy; legs reddish-yellow, spurs white, claws dark; pubescence rather sparse, especially on thorax; abdominal segments 1–5 fasciate apically, 6 and 7 with dense short appressed pubescence. All the pubescence is cinereous, that on thorax and vertex slightly yellowed, and on legs appearing silvery and glistening.

Class I, HEXAPODA.

Order II, COLEOPTERA.

BIOLOGIC NOTES ON SPECIES OF LANGURIA.

By F. H. CHITTENDEN,

WASHINGTON, D. C.

Until the year 1879, when *Languria mozardi* was reported by Professor J. H. Comstock in the stems of red clover (Ann. Rept. Comm. Agr., 1879, p. 199), none of the species of *Languria* were known to subsist at the expense of useful plants; in short, nothing appears to have been published prior to that time of the larval food habits of our American representatives of the genus. Messrs. F. M. Webster and C. M. Weed have both contributed to our knowledge of the biology of this species, and the writer has furnished in Insect Life (Vol. II, pp. 346–

347) some observations on it and *L. gracilis* Newm. The following notes, which were made several years ago, in the neighborhood of Washington, D. C., add some new facts in the life economy of the genus.

Languria mozardi Latr.

To the already long list of larval food plants of this species, which is now well-known under the name of clover-stem borer, may be added the Joe-Pye weed (*Eupatorium purpureum*) and thorough-wort (*E. perfoliatum*), from which the writer has reared it. Larvæ and pupa taken in stems of wild lettuce (*Lactuca canadensis*) and subsequently reared were both bright orange in color. A larva transformed to pupa September 2 and to adult 9 days later.

A chalcidid parasite, which Mr. Ashmead has described as *Habrocytus languriæ*, and which was found still more commonly with *L. trifasciata* was reared from *mozardi*. A larva of the parasite found attached to a beetle larva a day or two later detached itself from its host and transformed to a naked pupa, the imago appearing September 17. The pupal period of the parasite in this case was between ten and twelve days.

Languria bicolor Fab.

Beginning with the middle of June, this species has been observed in numbers on pale Indian plantain (*Cacalia atriplicifolia*) at Glen Echo and Cabin John, Md. Every plant at this time bore near its summit a pair of the beetles, which species by the way had not hitherto been taken by anyone connected with the U. S. Dept. of Agriculture in the neighborhood of the District of Columbia. The leaves were much eaten, and every stem showed the egg nidus of the beetle. By the first week of September most of the inhabitants of the stems of plants growing in bottom land exposed to the sun had transformed to pupæ and beetles. On higher ground in woodland, on plants growing in more or less shady locations, larvæ were also taken, there being a noticeable difference in the rapidity of development of the species, due to the different environment. Only a few uninfested plants were noticed. Some contained only one or two individuals, but usually stems are hollowed from the base to the flowers, four or five individuals occupying a single stem. As in the case which will be mentioned of *Lactuca* infested with *L. trifasciata*, the presence of the insects in the stems had no appreciable effect on the vitality of the plants, although galls were frequently formed through the work of the larvæ.

In one plant, eight feet in height, a beetle was found in the stem an inch below the surface of the earth, and the burrows extended to the top of the stem, which was withered and somewhat blackened. The burrows measure from three to six inches in length, and the castings which fill the hollowed stems between them occupy a similar space, and often a considerable space intervenes that is unoccupied. It was quite noticeable that the stems where broadest usually contained adults or pupæ that were larger than those occupying narrower portions of the stems at the tops, and that the individuals near the base develop earlier, beetles being found there while larvæ were at the top.

A pupa was being devoured by a mite related to *Pediculoides ventricosus* Newm.

Languria trifasciata Say.

This beautiful species develops in the stems of wild lettuce (*Lactuca canadensis*). Oviposition has been observed at intervals from the middle of June to the first of July. About Washington the insect can be found at any time in August in its three stages within the stems. August 4, exit holes were observed in empty stems, indicating that adults begin to issue from them toward the latter days of July. The proportion of the different stages in the stems from August 4 to 19 was: one larva and one pupa to three adults. In most stems the interiors had turned brown and the larvæ that had occupied them had apparently worked throughout their full length, as there was more or less frass and other evidences of their presence from the roots up to the narrowest part of the stem which the larva was capable of penetrating. In some stems the larva forms a covering of castings two or three inches from the base; in others the pupa case is formed as many as two feet from the roots, the location of the castings being reversed, *i. e.*, at the bottom. The beetle in exit cuts through at any point from the roots to near the tops of the stems.

Nearly every plant of *Lactuca* that could be examined had been infested by this insect; yet it had not always visibly affected their development. Those that were entirely free from attack were still green while the lower leaves had begun to wither. Some infested plants were nine or ten feet in height and were still healthy in appearance. In only one case was there evidence that more than a single larva inhabited a stem, from which it may be surmised that in case two or more eggs are deposited in the same stem, which undoubtedly

sometimes happens, as we know to be the case with the preceding species, the older larva destroys the others. In the exception noted a number of parasites were observed in the lower part of the stem, and a small larva probably of this species in the upper end.

Many individuals of the chalcidid *Habrocytus languriæ* Ashm. were noticed in the infested stems. Three colonies, each composed of an even half dozen pupæ of this species, were found, one colony in a *Languria's* cell, which gave forth imagos August 23.

Languria gracilis Newm.

About the District of Columbia this species is fairly abundant on different species of *Erigeron*, in about equal numbers on *E. canadense* and *philadelphicum*. On the latter plant oviposition was noticed, eight or nine minutes being consumed in depositing a single egg. The writer has previously recorded (Insect Life, Vol. II, p. 347) the occurrence of this species on *Urtica* and *Ambrosia*.

Languria læta Lec.

To the above should be added the capture of larvæ and adults of *L. læta* by Mr. E. A. Schwarz in the stems of *Datura* at Hearne, Texas, August 6, 1894.

INSECTS BREEDING IN ADOBE WALLS.

By Gustav Beyer,

New York, N. Y.

During a collecting trip to Cape San Lucas, Lower California, made in 1901, I had my headquarters at Santa Rosa, where I lived in a house of adobe walls and a roof of palm leaves. Glass windows being unknown in this section, two holes in said wall served as windows. It was during the month of July that I noticed numerous beetles on one of these improvised windows; all of which were covered with the flour-like dust of adobe. On further investigation, I found that these came out of the adobe wall, numerous small holes at about two to three and a half feet from the ground disclosing where these insects had come from. The insects were:

Lyctus californicus Casey. Very abundant.
Elasmocerus californicus Fall.

Tillus occidentalis Goch.
Tarsostenus univittatus Rossi.
Teretrius lebatus Horn.

A small wasp.

Lyctus were very plentiful. I could count sixty of these before I was able to detect one of the other species. This adobe wall was two years old and as hard as stone, yet the larva of *Lyctus* had no difficulty in accomplishing the immense work of boring through this composition and changing the solid interior into a powdered substance analogous to flour. The three Cleridæ are undoubedly parasites of *Lyctus* and the little wasp is also a parasite of either *Lyctus* or one of the Cleridæ. *Elasmocerus californicus* came out only in the forenoon between half past nine and half past eleven o'clock; the other insects were more abundant toward evening.

I did not take these insects at any other place, with the exception of *Tillus occidentalis*. This species would frequent also old logs, and toward evening would peep out of holes bored by Scolytidæ. On some occasions they would come out and run about a little, but it would not be long before they would return to these holes.

Class I, HEXAPODA.

Order IV, DIPTERA.

DIPTERA FROM SOUTHERN TEXAS WITH DESCRIPTIONS OF NEW SPECIES.

By D. W. COQUILLETT,

WASHINGTON, D. C.

During the past summer Mr. Charles Schaeffer spent several months collecting insects, chiefly Coleoptera, in the vicinity of Brownsville, Texas, in the interest of the Brooklyn Institute of Arts and Sciences, and secured, among other things, a small but very interesting collection of Diptera, a series of which was submitted to the writter for naming, and has been returned to the Institute again. This series contained representatives of nine apparently new species besides eight other species which, so far as I am aware, have never been recorded from the United States, their most northern accredited habitat being in

Mexico. These latter species are listed herewith while the descriptions of the new ones follow the list:

Plecia bicolor Bell.
Obliogaster tæniatus Bell.
Sphærophoria picticauda Bigot.
Rhopalosyrphus guntheri Arrib.
Sphiximorpha pedicellata Will.
Masicera picta Wulp.
Micropeza stigmatica Wulp.
Diacrita costalis Gerst.

Cyphomyia schaefferi, new species.

Near *tomentosa*, but that species is credited with nearly hyaline, yellowish wings, a polished black front and face, etc. Black, the upper part of the head dark reddish-brown, scutellar spines, first two joints of the tarsi, and the halteres, yellowish; front somewhat polished, bearing a transverse pair of widely separated tubercles above its middle, and midway between these and the antennæ is a transverse pair of nearly contiguous, highly polished callosities in contact with the eyes; a narrow ridge extends from ocelli almost to the antennæ; face somewhat polished, thinly covered with pale yellowish tomentum; antennæ shorter than the thorax, the first joint twice as long as the second, the latter as wide as long, the third twice as long as the first two, of nearly an equal width, blunt-pointed at the apex, the eighth annulus shorter than the seventh; eyes rather densely pilose, greenish and marked with about six transverse, undulating, purplish bands; thorax and scutellum somewhat opaque, thinly covered with a short, pale yellowish tomentum; abdomen somewhat opaque, its tomentum golden yellow, sparse on the first two segments but dense on the other two; wings brownish, the base, proximal half of axillary cell, discal cell, upper outer angle of second basal cell and base of the first posterior cell, hyaline, stigma yellow; length, 8 mm.

A female specimen collected in June. Respectfully dedicated to Mr. Charles Schaeffer.

Phthiria unimaculata, new species.

Near *scolopax*, but each cheek marked with a single black spot. Head yellow, middle of front brown, a spot at the ocelli, the center of the occiput, and a large, subquadrate spot on each cheek just below the front and extending from the eye almost to the oral border, black; antennæ and mouth parts black, proboscis slightly over one half as long as the head and body, apex of palpi about opposite middle of third antennal joint, the latter of nearly an equal width, its upper and lower edges only slightly convex. Body yellow, mesonotum with three broad vittæ and the narrow lateral margin brown, the median vitta extending from the front end to slightly beyond the middle, the next two unite at the hind margin of the mesonotum, a spot near center of pleura, the breast, middle of metanotum, and a crossband at base of each abdominal segment, brown; mesonotum opaque, gray pruinose, the abdomen polished, scutellum with a brownish spot at the middle of its base; legs yellow, the tarsi brown; halteres yellow, the knobs on greater part of upper side and at base of under side brown;

wings hyaline, a brown spot at base of second submarginal and each posterior cell, also at middle of first basal and at base of discal cell; space between apices of auxiliary and first vein yellowish, the costal margin beyond apex of first vein bordered with smoky brown, veins at bases of second submarginal and third posterior cells appendiculate. Length, 5 to 6 mm.

Two females, one collected at the Rio Ruidoso, White Mts., New Mexico (altitude about 6900 feet, C. H. T. Townsend), the other collected by Mr. Schaeffer, in June, at Brownsville, Texas.

Type. — No. 7352, U. S. National Museum.*

Holopogon latus, new species.

An unusually broad, robust species. Black, the halteres yellow, their bases brownish; hairs and bristles white or yellowish, hairs of mesonotum except posteriorly very short and sparse. Head gray pruinose, hairs of mystax very sparse, the bristles confined to two or three rows along the oral margin; first two joints of antennæ subequal in length, together about three-fourths as long as the third, the latter slightly longer than the slender style. Thorax and scutellum opaque, grayish pruinose, mesonotum with three confluent brownish-black vittæ, abbreviated posteriorly and the outer pair much abbreviated anteriorly. Abdomen somewhat polished. Hind legs considerably thickened, the tibiæ on the outer and inner sides and the first tarsal joint both above and below quite densely fringed with rather short hairs. Wings from base to beyond apex of discal cell dark brown, the limits of this color strongly arcuate, the remainder of the wing hyaline; apex of second vein before middle of second submarginal cell; wings very broad, the alulæ quite strongly developed. Length, 6 mm.

A male specimen collected in April.

Stenopogon tenebrosus, new species.

Near *consanguineus*, but much darker, the wings brown and without any yellow coloring. Black, the halteres, pulvilli and bases of tarsal claws yellow, a reddish yellow vitta on upper side of front femora, hairs and bristles yellowish-white, those on the hypopygium and in middle of mesonotum chiefly black; third joint of antennæ narrow and elongate, about seven times as long as the style; body grayish-pruinose, very thin in middle of mesonotum, the hypopygium polished; mesopleura bare, hypopleura hairy; wings, including the veins, brown, rather narrow, the first posterior cell slightly narrowed toward the apex, the fourth closed far from the wing-margin; length, 22 mm.

A male specimen.

Stenopogon pumilus, new species.

Also near *consanguineus* but darker, the bristles of the legs chiefly black, etc. Black, the halteres yellow, upper side of first two pairs of femora, their tibiæ and tarsi

* In my table of the species of *Phthiria* published in the Trans. Am. Ent. Soc., XXI, pages 102 and 103, it is stated that *punctipennis* has a single black spot on each side of the face; specimens since examined which undoubtedly belong to this species have two black spots on either side, as ambiguously stated by Walker in the original description.

reddish-yellow, pulvilli and bases of tarsal claws yellowish, hairs and bristles yellowish-white, bristles of legs chiefly black; third joint of antennæ rather slender and elongate, about ten times as long as the style; body grayish-pruinose; mesopleura bare, hypopleura hairy; wings dark brown along the broad hind margin and apex, the remainder largely tinged with yellowish, veins brown and yellowish, narrowly bordered with grayish, first posterior cell scarcely narrowed toward the apex, the fourth closed near the wing-margin; length, 14 mm.

Two males collected in April and May.

Stenopogon nitens, new species.

Distinguished by the polished abdomen. Black, the halteres whitish, pulvilli yellow and with two brown vittæ, tarsal claws reddish at the bases; hairs and bristles whitish, those on the antennæ, front, middle of mesonotum, abdomen except the first two segments, and on the legs except the coxæ, black, pubescence on inner side of front tibiæ golden yellow, hairs on lower side of front femora chiefly whitish; mesopleura bare, hypopleura hairy; third joint of antennæ rather slender and elongate, about sixteen times as long as the style; head and thorax grayish pruinose, the mesonotum, except along the sides and posterior end, somewhat polished; abdomen polished, a transverse, white pruinose streak in hind angles of segments two to five; wings blackish, tinged with yellowish in the costo-basal portion, veins black, first posterior cell considerably narrowed at the apex, the fourth closed in the margin; length, 16 mm.

A male specimen collected in May.

Erax tuberculata, new species.

Distinct from all of the species known to me by the three large tubercles on the venter of the abdomen. Black, the halteres, tibiæ and bases of tarsi yellow, apices of the tibiæ brown; hairs and bristles of head and antennæ white, a pair of ocellar bristles, a cluster at middle of sides of oral opening, and the hairs and bristles of the palpi, black; third joint of antennæ ovate, subequal in length to the first, about one third as long as the style; middle of face strongly gibbous and covered with bristly hairs except on the upper fifth, eyes unusually approximated at their upper corners, strongly diverging below. Thorax gray pruinose, marked in the middle with three black vittæ, the middle one narrow and not reaching the suture, the outer ones prolonged slightly beyond it; hairs of anterior half of mesonotum short, black, those along the margins chiefly white, the posterior portion bearing many long, chiefly white, hairs, the bristles mostly black; hairs of pleura and scutellum white, scutellum bearing two white bristles. Abdomen gray pruinose, when viewed from behind there is revealed a large, subtriangular black spot at the base of segments two to six, hairs of the abdomen white, those on the dorsum sparse and short, those on the upper side of the very large, polished hypopygium black; just behind the center of the under side of segments four, five and six is a polished tubercle which is nearly as long as the second tarsal joint. Hairs of legs white, the bristles of the first two pairs of femora and tibiæ chiefly white, those of the tarsi and hind legs black. Wings hyaline, costa scarcely thickened beyond apex of auxiliary vein, third vein forks beyond apex of discal cell. Length, 12 mm.

Three males, two of them collected at San Diego, Texas, April

30, by Mr. E. A. Schwarz, the other collected at Brownsville by Mr. Schaeffer, in April.

Type. — No. 7353, U. S. National Museum.

Anastrepha pallens, new species.

Distinguished by the three colored scutellum. Yellow, a vitta in middle of mesonotum, a broader one each side, the humeri, several spots on the pleura, a pair of spots in front of the scutellum and apical half of the latter, whitish, base of scutellum yellow followed by a brown fascia, a pair of brown spots in front of the scutellum, situated outside of and contiguous with the whitish ones; mesonotum not pruinose; wings hyaline, a spot beyond the humeral crossvein and the stigma yellowish-gray, a very faint pale grayish crossband extends across the wing at the hind crossvein and is narrowly prolonged along the costa to the tip of the fourth vein, hind margin of the wing also very pale grayish (specimen immature); length, 6 mm.

A male specimen collected in June.

Sepsis pleuralis, new species.

Recognizable among the unspotted winged forms by the wholly yellow pleura. Yellow, the front, upper part of occiput, mesonotum except the lateral margins, middle of metanotum and dorsum of third, fourth and base of fifth segment of abdomen, black, upper side of scutellum, posterior margin of second abdominal segment, and last three joints of the tarsi, brown; front polished, mesonotum subopaque, thinly brownish pruinose, metanotum polished and with a brassy tinge, dorsum of abdomen opaque, somewhat scabrous and with a strong bluish tinge; under side of front femora at two thirds of the length bearing an outwardly projecting tooth; wings hyaline, the base of the costal cell to slightly beyond the humeral crossvein, dark brown. Length, 4 mm.

A male specimen collected in June.

A NEW CERATOPOGON FROM BRAZIL.

By D. W. COQUILLETT,

WASHINGTON, D. C.

Ceratopogon guttatus, new species.

Black, the antennæ and apical portion of tarsi brownish yellow, mesonotum yellowish brown, humeri, scutellum and narrow ends of tibiæ yellow, halteres whitish, all hairs yellow; antennæ considerably longer than the head and thorax united; mesonotum opaque, yellow pruinose, the posterior portion whitish pruinose, abdomen opaque; legs slender, devoid of spines, a few rather long hairs on the tibiæ, first joint of hind tarsi nearly twice as long as the second, the penultimate joint nearly as long as the last one, claws equal, small, empodia wanting; wings hairy on about the apical half, base of wings to apices of first and fifth veins whitish-hyaline and marked

with about eight gray spots, a subtriangular one extending from costa to the fourth vein a short distance before the small crossvein, a subquadrate one extending from costa to the third vein just before apex of first vein, a streak on small crossvein and another on fourth vein a short distance beyond the latter, a small spot on upper side of fifth vein slightly beyond its middle and a larger one on the under side before its middle, a large one along hind margin of axillary cell near its middle and a curved one in apex of this cell; remainder of wing gray, a large whitish hyaline spot at apex of third vein nearly crossing the first posterior cell and extending along the third vein to the hyaline portion at base of wing, a second large whitish hyaline spot midway between apices of third vein and upper branch of the fourth, almost crossing the first posterior cell, a small hyaline spot in apex of second posterior cell and another a short distance before it, a larger one on middle of lower branch of fourth vein, one in apex of third and another near middle of hind edge of fourth posterior cell; upper branch of fourth vein, apical portion of the lower branch, and both branches of fifth vein narrowly bordered with hyaline; third vein connected near its middle by a crossvein with the first, apex of third vein beyond two-thirds length of wing, apex of first vein near middle of the third, fourth vein forks slightly beyond the small crossvein, axillary angle of wings well developed; length, 1.4 mm.

Three female specimens collected by Dr. A. Lutz.

Habitat. — Sao Paulo, Brazil.

Type. — No. 7724, U. S. National Museum.

THE LIFE HISTORY OF CULEX CANTANS MEIGEN.

By Harrison G. Dyar, A.M., Ph.D.,

Washington, D. C.

(Plate I.)

This mosquito flies most of the summer, but it is single brooded. The larvæ hatch from over-wintering eggs very early in spring, but the growth is not very rapid, probably a month being required before adults appear. These fly some weeks before becoming ready to oviposit. A female at New Hampshire was kept alive from July 20 to August 12; another taken August 8, laid eggs August 16. In British Columbia, a female taken June 15, laid eggs June 30 and these remained unhatched till the following year, although kept in water. They hatched as soon as the ice was melted in the jar the following spring.

The eggs (Plate I, Fig. 1) are laid singly and readily sink in the water. They are elliptical, the thickest part at one third from the

micropyle, one side flattened; finely reticulate, the reticulations elongated, the spaces between them depressed to form shallow pits, more prominent at the ends. At the micropylar end is a slight clear cushion. The sculpturing is distinct, apparently not granular, the outline being smooth except just at the ends. Length .8 mm., width .25 mm. The eggs are usually white when first laid, but soon turn deep black.

In the first larval state (Plate I, Fig. 2), the usual generalized characters are shown. The head is flattened, circular in front, antennæ rather long, uniform, with a single hair near the middle, uniformly infuscated. The body is normal, thorax enlarged, abdominal segments submoniliform, colorless, the hairs moderate, becoming weaker posteriorly. Air tube long, the outer third infuscated; a double row of pecten at base composed of lamellar dentate spines (Plate I, Fig. 4); lateral comb of the eighth segment a row of six or eight parallel bar-shaped spines (Plate I, Fig. 3). The anal segment has a small dorsal plate, the usual terminal tuft, but no ventral brush. The four anal processes are normal, large but not inflated nor conspicuously tracheate.

The second stage shows the usual definite change, although the mature characters are not fully developed. The head is much the same, the antennæ still with the tuft about the middle of the uniformly shaped joint. Body as before, the air tube, however, infuscated throughout (Plate I, Fig. 7) and with its pecten teeth modified into the more specialized shape of the adult larva, a spine with small teeth at the base (Plate I, Fig. 6). The anal segment has a larger plate, the ventral brush is present with slight tufts preceding the barred area (Plate I, Fig. 5). The comb on the side of the eighth segment is composed of thorn-shaped spines in a multiple row (Plate I, Fig. 8).

The third stage hardly differs at all from the second except in size. The spines of the lateral comb are more numerous, but the dorsal plate of the anal segment is still incomplete.

In the fourth stage the larva is mature. The head is rounded, flattened, mouth brush moderate, antennæ uniform, with the tuft at the middle, infuscated (Plate I, Fig. 9); the labial plate is broadly triangular, with coarse teeth at the sides, fine ones at the apex. The body hairs are moderate, the thoracic ones multiple, arising from infuscated tubercles but without any distinct posterior spine on the lower metathoracic tuft; abdominal hair diminishing posteriorly.

Air tube long, fully four times as long as wide, tapering regularly, a little flared at tip (Plate I, Fig. 11), the basal pecten distinct, the last two spines large and detached, followed by a single hair tuft at about the middle of the tube, infuscated. Lateral comb a patch of spines in about three rows (Plate I, Fig. 12), the single spines thorn-shaped, minutely divided around the base (Plate I, Fig. 13). Anal segment with a large dorsal plate which reaches near to the ventral line but does not encircle the segment. Anal tuft normal, the ventral brush large with small tufts preceding the barred area (Plate I, Fig. 10). Anal processes four, moderate, normal.

Pupa not distinguishable from those of its allies.

The larva falls between *canadensis* and *sylvestris* in its general characters but is differentiated by its abnormally long air-tube, which throws it in the "long-tubed section" of the synoptic table.

Eggs were obtained by me at Durham, N. H., and Kaslo, B. C. Preserved material examined, collected by Mr. F. Knab at Springfield, Mass., and by Mr. O. A. Johannsen at Ithaca, N. Y.

EXPLANATION OF PLATE I.

Fig. 1. *Culex cantans* Meig., egg.
Fig. 2. Larva, stage I.
Fig. 3. A single spine of the lateral comb of joint 8.
Fig. 4. A single tooth of the air-tube pecten.
Fig. 5. Stage II, diagram of the anal segment.
Fig. 6. A single tooth of the air-tube pecten.
Fig. 7. The air-tube.
Fig. 8. The lateral comb of the 8th segment.
Fig. 9. Stage IV, antennæ.
Fig. 10. Diagram of the anal segment.
Fig. 11. The air-tube.
Fig. 12. The lateral comb of the 8th segment.
Fig. 13. A single tooth of the comb.

Class I, HEXAPODA.

Order V, LEPIDOPTERA.

NEW SPECIES OF NORTH AMERICAN LEPIDOPTERA AND A NEW LIMACODID LARVA.

By HARRISON G. DYAR, A.M., PH.D.,

WASHINGTON, D. C.

Family NYMPHALIDÆ.

Brenthis andersoni, new species.

Light fulvous above with very little basal dark shading, the ordinary black markings small, well separated. Below, fore wings fulvous at base with small black spots, apex yellowish, stained irregularly with rusty brown. Hind wings rusty brown; discal spot small, round, black, distinct. In the base of the interspace of veins 1*b* and 2 is a triangular silvery white spot; another in the end of the cell continued over the cross-vein more than its own length in the cell, its tip rounded; a row of marginal silver spots between the veins. A few small yellow spots in the basal red area; median row of spots well defined, yellow, excised between the veins on both ends, edged indistinctly by blackish and only narrowly separated by the veins; outer area irregularly diluted with yellow, the largest illy defined patch over vein 4; submarginal spots brown, annular, not well defined; a row of brownish cusps within the silvery marginal spots. Expanse 43 mm.

One male, labelled Kootenay, B. C., from Mr. E. M. Anderson, who originally had three.

Type. — No. 7735, U. S. National Museum.

The species falls between *myrina* and *astarte* (Proc. ent. soc. Wash., v, 130, 1903), but is abundantly distinct from either.

Family LYCÆNIDÆ.

Thecla critola Hewitson.

Mr. Oslar has sent me a pair which he took in the Patagonia Mountains, Arizona, May 21. The sexes are remarkably dissimilar above.

The ♂ is a deep shining blue, the costa and outer margin of fore wings and the apex more broadly black, with a large, diffuse discal patch also black. This is simply a black spot, not a sex mark, its scales being unmodified. The hind wings are solidly light blue, except a very narrow edge. Two tails, the outer shorter; anal angle with two slight rounded prominences, preceded by a narrow white line. The ♀ is gray, the inner part of fore wings and most of hind wings washed with bluish gray. A blackish spot lies on the outer margin of hind wings between the tails and

there is a very narrow white terminal line. Below, the sexes are alike, gray, the basal two thirds especially of both wings squammosely strigose; outer line crenulate, very irregular on hind wings but not produced into W-shape, black, red within, white without. A black spot at anal angle and one between the tails, with red lunules within each and a narrow black edge. Expanse 22 to 24 mm.

Thecla oslari, new species.

Closely allied to *alcestis* Edwards. It is smaller, a grayer brown on the upper side, ashen gray, not brown below and the red markings beyond the outer band are less developed. Expanse 16 mm.

Two specimens, Tucson, Arizona (E. J. Oslar).

Type. — No. 7726, U. S. National Museum.

Family HESPERIIDÆ.

Thorybes mysie, new species.

Male without costal fold, the anal angle of secondaries scarcely at all produced, wings broad, trigonate. Fuscous brown, fore wings with whitish subhyaline spots: one in the end of cell, constricted or divided, a subcostal one above it; two subapical, one between veins 6 and 7 beyond these, one between veins 5 and 6, another between 4 and 5 still further out, the upper one sometimes wanting; a large one between veins 3 and 4 less far out, a still larger one between veins 2 and 3 slightly constricted and in an oblique line with the spot in the cell and on costa; a small one below vein 2 still further out and forming part of this straight line of spots, sometimes wanting. Fringe light fuscous. Fore wings below with the spots repeated, margin washed in purplish and spotted in fuscous. Hind wing purplish fuscous, two submacular bands of brownish, black edged, conjoined spots, the outer followed by a diffuse light band. Expanse 37 to 40 mm.

Described from two specimens, Patagonia Mountains, Arizona (E. J. Oslar).

Type. — No. 7737, U. S. National Museum.

Allied to *T. mexicanus* Herr.-Schaeff. and with much the same style of markings. It is, however, larger, without dark edging to the pale spots which are less whitish and the under side of the hind wings is marked much as in *Phoedinus caicus* Herr.-Schaeff. with distinct, well-contrasted markings, not in the obsolete manner of *T. mexicanus*.

Family NOCTUIDÆ.

Polia maxima, new species.

Nearly allied to *Polia acera* Smith, of which it may be a local form. It is, however, much larger and very distinctly marked. The markings appear to be the same as in *acera*, the ♀ type of which is before me. This specimen is old and worn, while the ♂ *maxima* is very fresh.

Lines as in *acera* but fairly distinct: t.-a. and t.-p. lines obscurely geminate, paler filled; ordinary spots separated, orbicular elongated, reniform with a slight spur below on the median vein, claviform large, pale filled, joined to the t.-p. line by a black dash. Subterminal space washed with lilaceous; subterminal line composed of a series of intervenular angles, pale, deep brown edged; veins outwardly black lined. Fringes dark, cut with ochraceous. Hind wing brown, diffusely shaded with black without, central veins black lined. The patagia have a distinct blackish inner submarginal line. Expanse 61 mm.

One ♂, Eureka, California, May 2 (H. S. Barber).

Type. — No. 7729, U. S. National Museum.

Pseudotamila avemensis, new species.

Thorax with mixed brown and whitish hairs, abdomen black, tipped with pale ocherous. Fore wings pale ocherous; basal space bronzy brown with black scales intermixed, basal half line of the ground color, outer edge of this patch formed by the t.-a. line, irregular, crenulate, marked by a white dot in cell and on vein 1; median space lightly shaded in bronzy, leaving a spot of the ground color at the inception of the t.-a. and t.-p. lines; reniform consisting of two parallel erect black bars, the other spots lost. T.-p. line irregular, lost, showing as dots of the ground color, defined by a narrow dark band of the color of the basal space, which edges it without. Terminal space of the clear ground color; a row of black terminal scales; fringe pale, of the ground color. Hind wings solidly black. Below black, the apex of fore wing broadly narrowing to anal angle with the fringe, an apical spot on hind wing pale, pinkish, tinted. Expanse 15 mm.

Described from two males collected at Aweme, Manitoba (Mr. Norman Criddle) and forwarded for determination by Dr. James Fletcher. One specimen in the National Museum, type no. 7734, the other returned to Dr. Fletcher.

The species does not coincide entirely with the generic definition of *Pseudotamila*, yet comes so near it that a generic separation seems unnecessary. The eyes are full and rounded, ovate, not as small as *Pseudotamila*, yet not of full size; the fore tibiæ are rather short and broad with one claw at one side at tip, two claws and a stout spine on the other; the front is smooth, bulging, prominent; vestiture of broad scales and hair.

Oslaria, new genus.

Male antennæ simple; eyes large, naked, unlashed; front slightly protuberant, a cup-shaped prominence much as in *Basilodes*, smaller than in *Plagiomimicus*: infraclypeal plate prominent. Tibiæ unarmed; fore tibiæ moderate, the tarsi very short though stout, the whole tarsus shorter than the tibia which is in turn shorter than the femur. Vestiture of thorax mixed scales and hair, a very slight double posterior tuft; abdomen untufted.

Type. — *Zotheca viridifera* Grote.

The type species I have received from Mr. E. J. Oslar, collected in the Catalina Mountains, Arizona. It was described as a *Zotheca* and transferred to *Plagiomimicus* by Smith, but seems entitled to a distinct generic name.

Oxycnemis subsimplex, new species.

Front slightly roughened, scarcely prominent, without tubercle; eyes large, naked, unlashed; vestiture scaly, a small upturned tuft at the end of the thorax of dark, non-metallic scales; male antennæ simple; tibiæ without spines, the anterior ones short and broad, corneous, with a large claw at tip and a short outer one; posterior tibiæ short, about equal in length to the femur, spurs normal, large; size small, form slender.

Thorax dark gray, collar sordid whitish, tipped with a line of dark gray; abdomen very pale brownish, untufted. Fore wing dark gray, t.-a. and t.-p. lines double, blackish, the pair of lines forming each rather remote, the inner one of the t.-a. line and the outer one of the t.-p. line fainter, filled by a slightly paler tint; t.-a. line broadly, slightly thrice waved, t.-p. gently curving around reniform which it touches, forming a nearly regular slight arc. Basal half line indicated; a faint, wavy whitish subterminal line. Ordinary spots black ringed, claviform and orbicular concolorously filled, reniform situated in the inception of a distinct white shade which runs to costa before apex. Fringe dark with narrow white basal line. Hind wing white, stained with fuscous on outer edge and on veins near costa. Expanse 24 to 27 mm.

Described from three males from Prescott, Arizona, May 19 (E. J. Oslar).

Type. — No 7736, U. S. National Museum.

The species has the type of markings of *Oxycnemis advena* Grote, but the lines are not excurved, while the apical white streak is prominent. It much resembles the female of *Aleptina inca* Dyar in markings, but is much larger and lacks the frontal structure of that form. There is no tuft of metallic scales on the thorax, which Grote gives as one of the characters of *Oxycnemis*, but Smith has described several species in this genus without it and there is present a posterior tuft of scales, though it is not metallic. From *Oncocnemis*, the genus differs in its slender form. Judging by a photograph before me, made by Dr. John B. Smith, the species exists in the Neumoegen collection with a manuscript name of the late Mr. A. R. Grote's as a species of *Oligia*.

Family NOTODONTIDÆ.

Apatelodes pudefacta, new species.

Light ashen gray, washed with brownish. Head and thorax gray, abdomen with basal and terminal tufts dark brown. Fore wings gray, light at the base; a diffuse

brown spot on the basal third of inner margin divided by a short white line; an oblique line from basal third of costa to outer fourth of inner margin limits the pale basal space and is darkly shaded without. Transverse posterior line brown, slender, excurved beyond the end of the cell, not waved, joining the oblique line above inner margin; subterminal line white, slender, excurved and parallel to the t.-p. line, not waved, followed at apex by two black spots, the lower of which may have at its tip a semi-hyaline white spot joined to the t.-p. line by a slender white line. Terminal space lightly brown shaded. Hind wing pale brownish with mesial whitish line and brown marks on the inner margin. Expanse 37 to 40 mm.

Three males, Guadalajara, Mexico (Neumoegen), Nogales, Arizona (Oslar).

Type. — No. 7727, U. S. National Museum.

Near *Apatelodes diffidens* Druce but the transverse posterior line is distinct and continuous.

Family LIMACODIDÆ.

Adoneta bicaudata, new species.

I have been keeping *Adoneta leucosigma* Packard separate from *spinuloides* Herrich-Schaeffer on the strength of a light colored specimen in the National Museum. The recent receipt of more specimens of the light form, makes certain that it is specifically distinct, but also that Packard's description cannot apply to it. I therefore refer *leucosigma* as a synonym of *spinuloides* and describe the light from under the name *bicaudata*.

It is of a light ochraceous color, the fore wings narrowly and diffusely margined with cinnamon brown. In some, this color is lightly overspread on the ocherous part and there is a faint median shade of the dark color. Markings as in *spinuloides:* a black discal dot more or less obscured; a silvery streak on costa and inner margin joined by an excurved row of blackish spots.

Described from 8 specimens, Washington, D. C. (?), marked "344, October 7, 1883, issued July 16, 1884," Plummer's Island, Maryland (E. A. Schwarz), Tryon, North Carolina (W. F. Fiske).

Type. — No. 7728, U. S. National Museum.

A blown larva is before me, marked "344," and it is the larva tentatively identified as *Monoleuca semifascia* by me five years ago.*

Larva. Long, rather narrow, quadrate, a little tapering behind. Dorsum broad, flat, not arched and scarcely higher at joint 5, yet a little so. Subdorsal ridge indicated by change in direction. Sides perpendicular or nearly so, the lateral space broad, continuous with the subventral space which is infolded in the middle. Subdorsal horns distinct, short, those of joints 3, 4, 5 and 12 moderate, those of joint 13 long, nearly three times as long as the ones on joint 12, the rest short, those of joints

* Journ. N. Y. Ent. Soc., VII, 236, note, 1899.

8 and 11 a little larger than the others. Side horns short, sessile, wider than long, those of joints 3 and 4 a little longer than those of 6 to 12. Caltrope patches on the horns of joints 6 to 12 and on the base of the subdorsal horn of joint 13, large on joints 12 and 13, then progressively smaller till the horns of joints 6 and 7 have only a few or no caltropes. Skin finely clear granular except on the horns. No end spines. Dorsum yellow or red shaded, a purple band with white glandular dots and central dorsal line much as in *spinuloides* but of different shape. It widens between joints 3 and 4, 4 and 5, then moderately widens on joints 6 and 7, narrows to a slight bordering of the white dorsal line over joint 8, widens behind the horns on 9 and 10, moderately, widens between joints 11 and 12 and ends, joint 13 being green above. A bright red, diffuse, subdorsal band; all the subdorsal horns red. Below a yellow stripe, narrowly red edged, waved. Sides green, a row of yellow dashes along the lateral horns, green edged above; yellow rings on spaces (4). A white line along the subventral edge. Stinging spines short, not numerous. Depressed spaces (1) and (2) represented by white dots, (1) paired and on joints 3–4 and 4–5 also double; depressed space (4) reniform, distinct; slight hollows subventrally; spiracle of joint 5 moved up out of line.

A NEW SPECIES OF ETHMIA FROM THE BOREAL REGION OF COLORADO.

By August Busck,
Washington, D. C.

Ethmia caliginosella, new species.

Labial palpi long, recurved; second joint somewhat loosely scaled on the underside, terminal joint short; both joints black. Face, head and thorax black. Fore wings dark slaty gray with a black longitudinal streak on the fold from back to beyond middle of wing and another black longitudinal line from the middle to the end of the cell. This latter streak is dilated at the end of the cell into a circular black discal spot from which radiate a few indistinct and interrupted narrow black lines along the apical veins. Around the apical edge is a conspicuous row of black dots.

Hind wings dark slaty gray with a very narrow black line around the edge before the cilia. Abdomen black with the exception of the three last and part of the fourth segments, which are bright orange-yellow. All legs blackish. Expanse, 23 mm.

One ♀ specimen, Silverton, Colorado, 12,000 feet altitude (C. P. Gillette).

Type. — No. 7733, U. S. National Museum.

Nearest and quite close to *Ethmia monticola* Wals., described from Oregon. (Proc. zool. soc. Lond., 1880, p. 87, Plate XII, Fig. 3); easily distinguished, however, from this species by its smaller size, its darker head and body, its black posterior legs, smaller yellow area of the abdomen and by minor differences in the pattern of the wing.

A CASE-BEARER INJURIOUS TO APPLE AND PLUM IN CHINA (COLEOPHORA NEVIUSIELLA, NEW SPECIES).

By AUGUST BUSCK,

WASHINGTON, D. C.

An interesting sending of living *Coleophora* larvæ was received last year at U. S. Department of Agriculture from Mrs. John L. Nevius, Chefoo, China. The larvæ were enclosed with a small apple twig in a pasteboard box tightly sealed by gummed strips. It left Chefoo May 16, 1903, and arrived in Washington, June 20. On opening the box it was found that all had come alive; some of the moths had issued during transit and were somewhat rubbed, but subsequently several more issued. In a letter of May 16 Mrs. Nevius wrote that these insects were first brought to her attention in a garden of foreign fruit trees in Chefoo by a native gardener, who said that they were a new kind of worm, which had recently made their appearance and which did great damage to the apple and plum trees in his garden. Later the same insect was found damaging apple and plum in the sender's own garden. Other native gardeners complained of its injuries, also believing it a "new worm." This testimony together with the fact that a large number of foreign fruit trees has been imported to this part of China, and considering how easily *Coleophora* could be introduced with them, made it seem probable that it might be an American or a European species of *Coleophora* which caused the damage complained of; but I have been unable to identify the species with any described *Coleophora* from Europe or America. I am inclined to believe that the species is a native of China, which has transferred its attack from some allied native tree to the imported fruit trees.

It belongs to the same group as our so-called Cigar-case-bearer (*Coleophora fletcherella* Fernald), which also feeds on apple and plum.

Coleophora neviusiella, new species.

Antennæ dark brown with sharply defined silvery white annulations; basal joint with slightly developed tuft. Labial palpi dark fuscous, silvery on the inner side and with tips of both joint whitish; tuft on underside of second joint very small. Head and thorax dark fuscous; face somewhat lighter. Forewings dark shining, fuscous, evenly sprinkled with steel gray and bluish white scales; on the middle of the

fold is a not very pronounced blackish longitudinal line and at the end of the cells is a still less noticeable blackish area, darkest towards the base of the wing, which in well preserved specimens produces, for a *Coleophora*, the unusual effect of a transverse marking. Cilia lighter fuscous. Hind wings shining, dark fuscous. Legs whitish, strongly sprinkled with light brown on the outer sides. Expanse 12–13 mm.

The cases are what has been termed "cigar-shaped," that is straight and nearly cylindrical though somewhat compressed; the neck is slightly bent and the other end is contracted and three-lipped. The case is made of the epidermis of the leaf sewed together and lined with yellow silk which gives it a rich ocher yellow color. Length of case, 8–9 mm.

Type. — No. 7730, U. S. National Museum.

A NOTE ON AGIA EBORATA HULST.

By Rev. Geo. W. Taylor,

Wellington, B. C., Canada.

This moth was sent to me by Dr. Wm. Barnes, bearing two labels, one his own and one that of Mr. H. D. Merrick. On each label the moth is called *Cœnoclape parinotata* Zell.; but as I have the real *parinotata* from California, I knew this to be an error. Later Mr. Merrick wrote me that it was so and that the moth was *Agia eborata* Hulst, named from comparison with the type in the Hulst collection.

The single pair of spurs on the hind tibiæ with the ciliate antennæ limit it to two genera, *Cysteopteryx* and *Agia*. Hulst distinguishes *Cysteopteryx* as having one accessory cell, while *Agia* has two. But Packard, who described the type of *Cysteopteryx* (*viridata* Pack.) figures the moth with two cells. Again Hulst says the genus should have palpi short, but Packard (of *viridata*) says palpi of great length, which is also the case in *eborata*. In point of fact the only differences that I can find to be left in the genera are that one has a frenulum and the other not and that one has the hair pencil in the male and the other not. I cannot see either frenulum or hair pencil in my specimens with an ordinary lens. The description of *viridata* Packard in the Monograph and of *eborata* by Hulst might quite easily apply to the same insect.

NOTE BY THE EDITOR.

Mr. Taylor presents arguments which indicate that *Agia eborata* Hulst is a synonym of *Cysteopteryx viridata* Pack., and that Hulst made several errors in his generic definition of *Cysteopteryx*. *Cysteopteryx*, then, cannot stand, since it is founded on a total misconception, although it has priority over *Agia* by two pages. Hulst placed the genera in different subfamilies and we cannot conceive how he could have made these mistakes except by a very marked misidentification of Packard's *viridata*. If this be true, the species which Hulst had before him remains to be found.

Class I, HEXAPODA.

Order XI, ORTHOPTERA.

THE GENUS CYPHODERRIS.

BY A. N. CAUDELL,

WASHINGTON, D. C.

This interesting genus, comprising the only winged representative of the subfamily Stenopelmatinæ found in North America, was described by Professor Uhler in 1864. The generic bibliography is as follows:

Uhler, Proc. Ent. Soc. Philad., ii, p. 551–552 (1864).
Scudder, Can. Ent., xxxi, p. 113, 117 (1899).
Scudder, Can. Ent., xxxiii, p. 18 (1901).

The genus may be characterized as follows:

Form short and stout. Legs short and moderately robust, the posterior pair scarcely saltatorial. Anterior coxæ bear an obtuse spine, often reduced to a merely noticeable angular projection; tarsi compressed, provided with pulvulii; anterior tibiæ spined on both margins below, above on the inner margin only, dilated and furnished with a broad and long tympanal cavity, visible on both faces; femora unarmed. Prosternum with a pair of broad, transverse, somewhat elongate tubercles; sternal plates prominent, posteriorly concave, the lateral angles usually quite prominent. Elytra present, small in the female, large and with a well developed musical organ in the male. Thorax cylindrical in the female, in the male posteriorily much dilated and inflated. Genital organs of the male forming a short capitate process projecting obliquely backwards from the base of the tip of the scarcely tapering abdo-

men; this capitate process bears near the end a pair of broad, flattened lateral processes; female without an exerted ovipositor; cerci well developed, four or more times as long as broad in both sexes.

This genus is referred by Professor Scudder to the group Anostostoma, but the little developed spines of the anterior coxæ, the fully developed tegmina and the northern distribution indicate a wide deviation from the typical forms. The well developed sound organs of the male tegmina is at variance even with the subfamily characters. It is the only genus of the Anostostoma found farther north in America than Mexico, and as remarked by Professor Scudder, the occurrence of the genus so much farther north than any of the allied genera is very singular. The old world representatives of the group are found in the southern hemisphere.

But one species of *Cyphoderris* is known.

Cyphoderris monstrosa Uhler. (Figs. 1, ♀; 2, ♂.)

Uhler, Proc. Ent. Soc. Philad., ii, p. 552 (1864).
Walker, Cat. Derm. Salt. Brit. Mus., ii, p. 248 (1869).
Thomas, Proc. Davenp. Acad. Nat. Sc., i, p. 263, pl. 36, fig. 7, male (1876).
Scudder, Can. Ent., xxxi, p. 117 (1899).
Scudder, Can. Ent., xxxiii, pp. 17–19 (1901).
Scudder, Cat. Orth. U. S., p. 80 (1900).
Turley, Can. Ent., xxxiii, pp. 246–248 (1901).
Scudder, Psyche, ix, p. 167 (1901).
Caudell, Ent. News, xv, p. 63 (1904).

Description. — Head subglobose, rather deeply inserted in the prothorax; fastigium of the vertex broad, separate from the front and produced very slightly between the antennæ; eyes rounded, broadest above, widely separated, being separated by a space nearly five times as broad as one of the eyes. Antennæ slightly longer than the body in both sexes, filiform, slightly tapering, basal segment long and about twice as broad as the succeeding ones, second segment subquadrate, less than half as long as the first; third twice as long as broad, the succeeding ones, up to about the fiftieth, transverse, the remaining ones longer than broad. Clypeus broader than long, narrower below; labrum longer than the clypeus and as broad as the lower portion of it; terminal segment of the palpi slightly longer than the preceding one. Pronotum broad, subtruncate both before and behind in the male, in the female broadly rounded behind; in the male the pronotum is ampliate in front to receive the head and behind is still more ampliate and much inflated so as to overlie for some distance the base of the wings, the posterior lobe is flattened above and is much broader than the anterior lobe; in the female the pronotum is subcylindrical, scarcely broader behind than in front and scarcely at all inflated; in both sexes the pronotum is somewhat constricted mesially and the lateral lobes are shallow, posteriorly rounded, not at all sinuate, the lower margin meeting the anterior margin in a broadly rounded angle Tegmina of the male broad and ample, usually covering two thirds or more of the abdomen; stridulating area well developed and the lateral field broader than

the lateral lobes of the pronotum; in the female the tegmina are small, overlap but little and project beyond the posterior border of the pronotum scarcely more than their length; wings as long as and shaped similarly to the tegmina in the female; in the male they are nearly as long as the tegmina but shrunken and useless. Legs short and moderately stout; tarsi about half as long as the corresponding tibiæ, the basal segment equalling in length that of the second and third together, being a little shorter than the terminal segment; the fore tibiæ have one or two spines above on the inner margin and below are armed with from one to three spines on each margin; middle tibiæ armed with two or three spines on each margin above and below with a single one or rarely two, near the anterior margin towards the tip* posterior tibiæ slightly expanding from the base to the tip, armed with from five to seven spines on each margin above and unarmed beneath. Besides the spines each tibiæ is furnished at the tip with large stout calcaria; posterior femora but little swollen, scarcely fitted for leaping, externally deeply sulcate near the lower margin. Abdomen large and heavy, apically truncate, tapering very little.

Professor Scudder has described the color of the living female as follows:

"Head above the antennæ bronze black, longitudinally marked with pallid luteous; genæ and face below the antennæ pale lilac, excepting the clypeus and labrum, which are pale lemon yellow, the whole marked with blackish; palpi pallid, feebly infuscated, especially the maxillary pair, in stripes and apical marginings, the extreme apex of apical joint pallid; basal joint of antennæ pallid, with broad basal and narrow subapical fuscous annuli, the remaining joints bronze black; eyes castaceous.

Pronotum subcylindrical, subequal, very feebly constricted just in advance of the middle, dull luteous with a nacreous sheen, the posterior edge and lower margins of the lateral lobes flavous or flavescent, the whole heavily and massively marked, especially in the constricted region, with very dark glistening bronze green, the whole surface, whether dark or light, sprinkled very sparsely and very inconspicuously with luteous dots. Sternal parts of thorax luteous, more or less infuscated. Tegmina reduced to minute membranous testaceous pads, concealed beneath the pronotum. Coxæ and trochanters blackish fuscous; femora luteotestaceous, the whole apex and a broad longitudinal median band on the outer side subpiceous; tibiæ pallid luteous, with a piceous stripe following the upper lateral spinigerous margins, heavier in basal than in apical half; the spines pallid or luteous, tipped with black, excepting the apical spines, which are almost wholly fuscous; tarsi very pale red beneath, pallid above, edged apically with fuscous.

* Scudder says the intermediate tibiæ are unarmed beneath.

Abdomen very plump, deeper than broad, having above the same color as the pronotum, the luteous nacre forming the base, and the bronze green, somewhat embrowned, confined to the apical margins of the segments in an irregular edging; sides of the abdomen between the dorsal and ventral scutes pale brown, sparsely sprinkled with pallid dots, the spiracles glistening bronze."

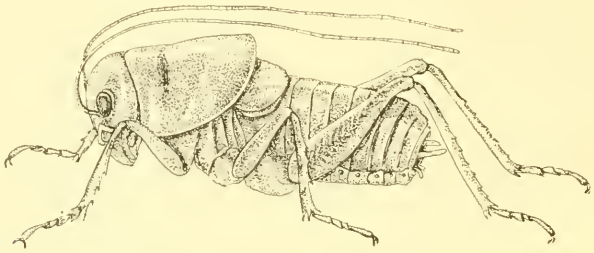


FIG. 1. ♀.

The colors of the male agree in general with those of the female except on the pronotum. Here the anterior lobe is shining black while the ampliate hinder lobe is dull luteous, the black of the anterior lobe rarely extending back upon the posterior lobe to any extent except in the variety *piperi*, described in this paper.

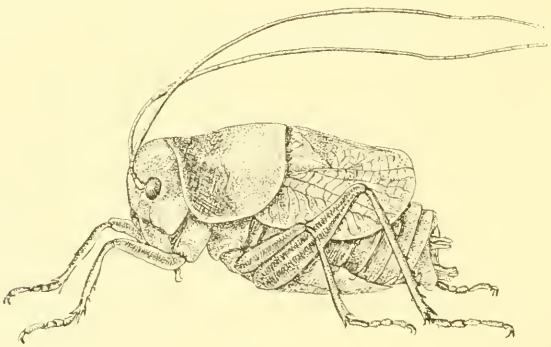


FIG. 2. ♂.

The wing characters of the female described by Scudder agree with those of what I have considered as immature forms. In the single specimen before me, which I refer without doubt to the adult form, the elytra are fairly well developed, nearly black, projecting well

beyond the thorax and slightly overlapping; the wings of the same development and shape as the elytra, being about as broad as long and nearly round. Those specimens with minute, widely separated elytra almost hidden beneath the thorax I have considered as nymphs, although some are fully as large as the single undoubted adult before me. These supposedly immature forms differ from the adult in having undeveloped wings and the legs are usually shorter, the posterior femora of even the larger specimens being in some cases scarcely more than 8 mm. in length. It is possible that this species is in the midst of the evolutionary process of becoming apterous, as indicated by the aborted under wings of the male. In this case the female with more fully developed wings may be a case of reversion to the ancestral type, in which case the supposedly immature forms may really be adults. Further material and study is needed to settle this point. I have seen no immature male specimens. One of the immature female specimens from Pullman, Washington, is wholly shining bronze black above on head, thorax and abdomen.

The following measurements are made from specimens before me.

Entire length, head to tip of abdomen, male, 21 mm., female 22 mm.; thorax, male, 8–9 mm., female, 8 mm.; posterior femora, male, 8.5–9 mm., female, 10 mm.; elytra beyond pronotum, male, 7.5–8.5 mm., female, 2.5 mm.

The type specimens, two males from Oregon, are now in the Museum of Comparative Zoölogy at Cambridge, Mass.

This species, though for a long time considered a rare insect, the female insect being unknown till 1901, has now been found in injurious abundance in Idaho, eating off the fruit buds of peach and cherry trees. Mr. Louis W. Turley has given a most interesting account of this insect, Can. Ent., xxxiii, 246–268 (1901). The following notes are taken from this account, which embodies nearly all that is known of the natural habits of the species. The writer found the males in considerable numbers in a pasture near Moscow, Idaho, where they were sitting on posts, grass stems and other objects at dusk. Here they sat, several inches to a foot above ground, with the head down, and stridulated with their short broad wings. The inverted position seemed to be assumed to facilitate escape when disturbed, though the writer states that they crawl slowly down when disturbed, though one would naturally expect them to drop suddenly to the ground in such a case. The notes are said to resemble those of the tree cricket,

Œcanthus fasciatus [*nigricornis*], but are more subdued and ventriloquial, and with longer pauses between the measures When captured the songster, which mimics very closely in appearance old empty capsules of the fleur-de-lis, made no struggle. When two were put together in the light they fought fiercely, one or both lying down, kicking and biting. Many males were taken but no females were found. Later a Mr. Stanley reported the insect in injurious numbers at Cœur d'Alene, Idaho, where they ate the buds of fruit trees, the females alone being concerned, the males not being seen at this place. Specimens were sent to the Experiment Station of Idaho by Mr. Stanley where the identification was made. The most destructive visit of the insect is said to have lasted about three weeks during the month of May and the best way of combatting them was to jar them into sheets spread under the trees at night. They are said to live in holes in the ground, coming out at night to feed. It scarcely seems credible that these devastating females were really of this species but, if so, the best remedy would seem to be the placing of bars around the trees to prevent the insects from climbing up them.

This insect seems incapable of leaping more than half an inch. They are nocturnal in habit being more active by night than by day. They are clumsy, slowly moving creatures. The only living specimen I ever saw, one taken at Ainsworth, B. C., was floundering helplessly in a wagon track.

The following material comprises all the material seen by me: Banff, Alberta, one mature female, August 8, 1903 (N. B. Sanson); one immature female, 1902 (J. Fletcher); Ainsworth, B. C., one immature female, July 10, 1903 (A. N. Caudell); Bear Mt., Lolo Trail, Idaho, alt. 6,000 ft., one immature female, August, 1902 (C. V. Piper); Pullman, Washington, alt. 2,500 ft., two mature males, no date (H. E. Burke); six mature males, May 10–June 2, 1901, and two immature females, April 5–May 10, 1902 (C. V. Piper); Mt. Rainier, Washington, one mature male, two immature females (C. V. Piper).

Except the type locality, Oregon, these represent all the localities from which this species has been recorded except Wyoming where it was collected by Putnam and recorded by Thomas in 1876.

The mature male and two immature females from Mt. Rainier constitute a rather striking variety which may be designated as *Cyphoderris monstrosa* var. *piperi*, and described as follows:

Cyphoderris monstrosa piperi, new variety.

Distinguished from the typical *monstrosa* by the average greater size, rougher and more opaque surface of the pronotum and by the color of the pronotum. In structure like *monstrosa* but different in general appearance. Pronotum more opaque and mesially more profoundly incised dorsolaterally, in the male the posterior lobe rising more rapidly posteriorly and the surface much more coarsely ridged longitudinally than in the typical *monstrosa* and the deep black of the anterior lobe is less glistening and is continued across the lateral lobes to the posterior border and thence along the hind border across the top, leaving only the center of the pronotum and the lower margin of the lateral lobes without infuscation.

Length, male, 27 mm., female, 31 mm.; pronotum, male, 8.5 mm., female, 7 mm.; posterior femora, male, 12 mm., female, 11 mm.; wings beyond pronotum, male, 8.5 mm., female, 1 mm.

Type. — No. 7723, U. S. National Museum.

The collector, in whose honor this interesting variety is named, furnishes the following note on the habitat of the insect:

"These specimens were collected in Paradise Valley on the south side of Mt. Rainier, Washington, at the point called 'camp of the clouds,' altitude about 6,000 feet. They were collected during the daytime hidden under débris in a grove of alpine fir. No memorandum was made concerning their notes."

Class III, ARACHNIDA,

Order I, ACARINA,

FOUR NEW SPECIES OF INJURIOUS MITES.

By Nathan Banks,

Washington, D. C.

(Plate II.)

The following four new species of mites are all of considerable economic importance. They have been received by the U. S. Department of Agriculture, Division of Entomology during the past year. The manuscript names of some of them have already appeared in print, therefore it is useful to have the technical descriptions issued at an early date.

Genus TETRANYCHOIDES Banks, 1904.

In October, 1903, Mr. W. H. Volck, of Berkeley, Cal., sent me some pieces of orange leaves infested with a mite unknown to him. The mites were in colonies of two or three up to a dozen or more; usually in a slight depression of the leaf. Each colony was evident to the unaided eye as a snow-white patch; this appearance being due to the fact that the moulted skins are retained attached to the spot. The mites and their eggs are located amongst them. The mite rests with its legs extended and the beak placed against the surface of the leaf. The eggs are spherical and hyaline. Here and there on the leaf were threads like those of the "red-spider"; it is probable that these were made by the mites.

The mites at first glance looks very much like a *Tydeus* (Family Eupodidæ), but *Tydeus* is a predatory, solitary mite. The affinities are with the genus *Eupalopis* Can., but it differs from this, as well as from all others of the family Tetranychidæ in having the last joint of the palpi attached to the tip of the preceding joint. On account of the appearance of a colony of these creatures, the mite may be commonly called, "the orange white spot."

Tetranychoides, new genus.

A Tetranychid, with moderately slender, tapering legs, each with two very short claws and a median pulvillus. Body transversely divided at anterior third; beak large, prominent. Palpus of five joints; the basal short, the next rather shorter, the third the largest, the fourth very short, the fifth about as long as the third, but not one half the diameter of the other joints, cylindrical, and tipped with a fine bristle. Legs in two groups; no eyes.

Tetranychoides californica, new species. (Plate II, Fig. 1.)

Pale yellowish, legs and palpi nearly hyaline. Body broadest at shoulders, tapering behind, rounded in front. Legs about three fourths as long as the body, palpi rather more than one half as long as leg I. The anterior tarsi show two long, erect bristles above; few other bristles on the legs. The body almost bare. Length 0.24 mm.

In colonies on under surface of orange leaves, Watsonville, Cal. (Volck).

Genus TENUIPALPUS Donn., 1877.

In August, 1903, Mr. S. A. Pease sent from Redlands, Cal., some bits of orange peel infested with a small pale mite. On examination these were found to belong to the genus *Tenuipalpus*, no species of which had been recorded from this country. The mites were quite numerous, and evidently do some damage, perhaps, however, not as

much as the "rust-mite." I have not seen the mites alive, so cannot say whether they live in colonies or not. The genus differs from other Tetranychidæ in the slender palpi, the furrows across base of abdomen and the short, thick legs. The species is described as follows:

Tenuipalpus californicus, new species. (Plate II, Fig. 2.)

Body broad; broadest in front across cephalothorax, tapering behind, but broadly rounded at tip. The side-margins of the cephalothorax, and the base of abdomen is deeply crenulate. The abdomen shows several transverse furrows on the basal part. There is a hair on the outer side of the cephalothorax, and three each side near the tip of the abdomen. The legs are short, and their margins more or less crenulate. They have but few hairs, and these on the basal joints. The venter of the female shows two smooth areas in the posterior part surrounded by furrows; the first is one and one half times as broad as long, the other just behind it is semicircular. The male is much more slender, although but little longer than the female. The latter with eggs is rather longer and with a more tapering abdomen; the eggs are elongate and red in color.

Length 0.2 mm.

On orange peel, Redlands, Cal. (Pease). In one of the lots sent were several Gamasid mites, evidently predaceous upon the *Tenuipalpus*.

Genus TARSONEMUS Can., 1876.

In the greenhouses of the U. S. Department of Agriculture there have been a number of small mango plants. Some of these stopped growing when about 12 to 18 inches high. The tip of the shoot was thickened and partly discolored. Investigation showed that they were infested with a new species of *Tarsonemus*. The mites occur on the surface of the swelling in considerable numbers, and their feeding seems to cause a stoppage of growth, and enlargement of the affected part—a gall, although without cavity.

Tarsonemus latus, new species. (Plate II, Fig. 3.)

Body (♀) broadly elliptical; beak short and broad. Legs I and II subequal, scarce half the length of body, with a few hairs toward tips; leg III longer than II, and more slender; leg IV still more slender and ending in two hairs, one much longer than the other. Body of male very broad, broader than long; beak conical. Leg I small; II larger; III longer than II, but more slender, IV very large and thick, the femur swollen on outside, a spinous process near tip of tibia on inner side, and a long hair from outside of tarsus near tip. Between the hind legs the abdomen ends in a broad, emarginate lobe, with a long bristle from each outer corner. Length 0.5 mm.

On young shoots of mango (in greenhouses) Washington, D. C.

Genus ERIOPHYES Sieb., 1850.

Sir David Morris, High Commissioner of Agriculture for the British West Indies, recently brought to the Division of Entomology some mite-galls on cotton from Montserrat. Mr. Ballou had preserved some of the mites on slides. Upon examining the material I find that the galls are caused by a mite, a species of *Eriophyes* which I propose to call *E. gossypii*. The cotton leaves were very heavily infested with the galls, so much so that many were a mass of roughened swellings, curled and distorted. Within the recesses of these galls the mites were found in abundance, together with many eggs. The damage to the cotton is so severe that a great deal of it was thrown into the sea. Mr. Ballou, in the "West Indian Bulletin," Vol. iv, p. 282, has given an account of the species. He recommends that the weeders working in the field be supplied with bags in which to put infested leaves, the bags, when filled, to be placed in boiling water.

Eriophyes gossypii, new species. (Plate II, Fig. 4.)

Body elongate, cylindrical, and tapering; about six times as long as broad; abdomen with about seventy rings; two pairs of bristles on lower sides, one at about middle of length, the other half way from this to tip. At the tip there is a truncate plate, from each outer corner of which arises a long curved bristle. Dorsum of cephalothorax subtriangular, the sides slightly undulate, and in front truncate; above with three irregular subparallel ridges each side, the inner one the longest. Legs short, the femora slightly thickened near base, a long bristle near tip of tarsus.

In galls on cotton leaves, island of Montserrat, West Indies.

EXPLANATION OF PLATE II.

Fig. 1. *Tetranychoides californica* Banks, *a*, mite, side view; *b*, palpus; *c*, tarsus I, and *d*, under side of beak.

Fig. 2. *Tenuipalpus californicus* Banks, *a*, ♂, *b*, ♀ from above; *c*, venter of ♀.

Fig. 3. *Tarsonemus latus* Banks, *a*, ♀, *b*, ♂ from below; *c*, affected mango shoot.

Fig. 4. *Eriophyes gossypii* Banks, *a*, mite; *b*, cephalothorax enlarged; *c*, section of gall.

JOURNAL

OF THE

New York Entomological Society.

Publishes articles relating to any class of the subkingdom Arthropoda, subject to the acceptance of the Publication Committee. Original communications in this field are solicited.

Editorial.

We published in the last number of this Journal an article by Mr. A. C. Weeks, which elaborates the theory that the coloration of the hind wings of the genus *Catocala* serve the purpose of diverting the attention of predaceous enemies from the vital parts of the insect. This view has been previously stated by Professor E. B. Poulton,* but the theory does not strongly appeal to us for the reason that the colored parts are concealed in repose and could only be seen by an enemy during flight or the short period while the wings are elevated before taking flight. We doubt whether the rapidly moving wings would be seized during flight, and, in the short period before or after flight while the colored wings are unconcealed, they would seem to lie dangerously near the abdomen. In the case of the genus *Thecla*, where the colored spots and tails on the hind wings, being kept in gentle motion during rest, give the false impression of being the head of the butterfly, these parts are well elevated above the abdomen and extend beyond it In this case the theory discussed by Mr. Weeks seems obviously applicable, but in the case of *Catocala* we incline to the view that the primary use is something else, perhaps as a recognition marking.†

We print in this number a list of Philippine Hymenoptera by Dr. Ashmead. We cordially indorse the suggestion that American ento-

* Poulton, "Colours of Animals," p. 206, 1890.

† Wallace, "Darwinism," p. 217, 1891.

mologists should take a more lively interest in Philippine insects. The fauna is interesting and must really be extensive, though as yet imperfectly known. A good preliminary catalogue was published in 1895 by Fr. Casto de Elera, entitled "Catalogo sistematico de toda la fauna de Filipinas, conocida hasta el presente," printed at the press of the College of Saint Thomas in Manila. It is somewhat marred, from our point of view, by the inclusion of the names of sundry exotic insects which happened to be in the collection of the College of St. Thomas. This is explained in the preface; but one gets an exaggerated idea of the number of Philippine insects known, if this matter is not kept in mind. We mention this book particularly, as it is not generally known in America, and will be the starting point of our future lists. The author enumerates the following number of species of Arthropods:

Class I, HEXAPODA.		
Order Hymenoptera	68,	Ashmead gives 183.
Order Coleoptera	1,573	
Order Siphonaptera	1	
Order Diptera	272	
Order Lepidoptera	793,	Semper gives 1,626.
Order Neuroptera	104	
Order Hemiptera	624	
Order Orthoptera	287	
Order Corrodentia	15	
Class II, MYRIAPODA	21	
Class III, ARACHNIDA	79	
Class IV, CRUSTACEA	176	

In the Lepidoptera, the butterflies listed are mainly Philippine species, but a considerable proportion of the moths, 55 out of 174 listed, are exotic species which will never naturally occur in the Philippines. The butterflies follow largely Semper's work,* but in the moths this was not then published. Semper gives 907 moths as against Casto de Elera's 119, a very gratifying advance.

WITH this number we have adopted the plan of classifying the articles according to the classes and orders of the Arthropods, grouping them under the appropriate headings. Our readers can now tell at a glance whether the number contains anything in their especial fields.

* Reisen im Archipel der Philippinen von Dr. C. Semper: Die Schmetterlinge der Philippinischen Inseln von Georg Semper. Wiesbaden, 1886–1902.

We avoid, besides, to a large extent questions of priority in the placing of articles. The system adopted is that of Comstock's Manual with the sequence reversed.

IT is customary for entomological journals to offer their subscribers the opportunity of having their insects named. We, therefore, call the attention of the readers of the JOURNAL to the excellent facilities of the U. S. National Museum for naming Arthropods in all groups. The usual privilege is reserved of retaining specimens that are desirable for the national collection.

PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY.

MEETING OF OCTOBER 6, 1903.

Held at the American Museum of Natural History.

President C. F. Groth presided with 13 members in attendance.

The minutes of May 19 were read and approved.

The treasurer, Mr. Joutel, reported the receipt of bills for printing 500 copies of the June number of the JOURNAL.

As more than the required number of JOURNALS had been printed and also owing to the fact that the JOURNAL was mailed at the third-rate classification, the bills called for an amount larger than usual.

The secretary was instructed to correspond with the publication committee and ask for more particulars in reference to the bills.

The librarian, Mr. Schaeffer, reported the receipt of the following exchanges:

Revista do Museum Paulista, Vol. V.

Entomologisk Tidskrift, 1902, Nos. 1, 2, 3 and 4.

Wiener Ent. Zeitung, XXII, Nos. 1, 2, 3, 4, 5 and 6.

Verh. d. k. k. Zool. Bot. Gesellschaft, Vol. LII and LIII, No. 1.

Mittheilungen Schweiz. Ent. Gesellschaft, Vol. X, No. 10.

Proc. Am. Acad. Arts and Sciences, XXXVIII, No. 18.

Proc. U. S. Nat. Mus., Vol. XXVI, Nos. 1333 and 1335.

Bulletin U. S. Nat. Mus., No. 52, 1902.

Anales del Museo Nacional de Buenos Aeres, 1902, Tome, 1 and 2.

Proc. Canadian Institute, July, 1902.

Zeitschrift für Ent. Breslau, 1902, No. 27.

Stettiner Ent. Zeitung, Vol. 64, No. 1.

Annales de la Société Ent. de Belgique, Vol. XLVI, 1902.

Deutsche Ent. Zeitschrift, from 1891–1903; but No. 1 of 1891, entire volume of 1892, and No. 2 of 1895 are missing.

Insect World, Vol. VII, No. 1, 1903.

Mr. Leng proposed Mr. Edward D. Harris, 280 Broadway, as an active member of the Society.

On motion the Secretary was instructed to convey to Mrs. Slosson the thanks of the Society for her donation of insects to be sold at auction.

Mr. Schaeffer stated that he would like to make a correction to the minutes printed in the June number of the JOURNAL as follows: "Mr. Beutenmüller exhibited in the meeting of December, a *Cassida* from Canada as *thoracica*, and not as *viridis* as wrongly stated in the footnote under the minutes of the meeting of January 20, in Vol. XI, No. 2, p. 113. He showed at the same time an article in Le Naturaliste Canadien on *Cassida thoracica* recently found in Canada and stated that he had received his specimens from that author as *C. thoracica*. This name was pronounced by me as incorrect and on question I stated that I think it is *C. viridis* but was not quite sure about it yet."

Moved by Mr. Joutel and duly seconded that a committee be appointed by the chair to draft resolutions on the death of Mr. A. R. Grote. Carried.

Various members of the Society gave an account of their summer's collecting experiences. Mr. Leng made a few remarks concerning the trip which he made to West Virginia in company with Dr. Love. They had been disappointed in not being able to secure any *Cychrus ridingsii* but had obtained a few *C. andrewsii*, one species of *Nomaretus* and a number of other good species of Coleoptera.

Dr. Seifert exhibited several hundred spread specimens of *Sabulodes arcasaria* Walk. which he had bred.

Mr. Comstock reported that he had taken a number of *Feniseca tarquinius* near the city the past summer.

Mr. Schaeffer exhibited some Coleoptera taken this year on his collecting trip to Brownsville, Texas, and made remarks on a few of the species. He was generally satisfied with the results of the trip but was a little disappointed with the April collecting, as he had expected to get different species during this month than Dietz and Wickham had taken during June and July; but he found few new things to reward him.

Mr. Davis exhibited a copy of Mr. A. R. Grote's "Hawk Moths of North America" printed by Homeyer and Myer, at Bremen, 1886, remarking that the title had not been included in the list of works on North American Entomology published in 1900 as Bulletin No. 24 N. S., by the U. S. Department of Agriculture.

Mr. Joutel remarked on the stridulation of *Cychrus viduus*. On capturing a specimen of this species he was much surprised to hear it make a squeaking noise, somewhat like the rustling of a dried leaf. On examination he found a ridge or process jutting out from the underside of the elytra and fitting into a groove at the side of the two last segments of the abdomen. The noise was produced by bending down the end of the abdomen. Both sexes are able to stridulate.

Mr. Barber reported on the taking of one specimen of *Anthophilax malachiticus* at Ft. Montgomery, N. Y., on May 30, of this year. He exhibited twelve specimens of *Cychrus elevatus* which he had taken at Langdon, Mo., in August.

MEETING OF OCTOBER 20, 1903.

Held at the American Museum of Natural History. President C. F. Groth in the chair with thirteen members present.

On motion of Mr. Leng the regular order of business was suspended and the reading of papers and scientific discussion preceded the regular business.

Mr. C. T. Brues spoke on the dipterous family Phoridæ and exhibited a collec-

tion of the North American species of the genus *Phora*. He mentioned the peculiar structure of the antennæ and the character of the wing venation, either of which make easy the recognition of any species of the family. He said that the family is represented by only about 125 species, of which about 70 are from Europe and the majority of the remainder from North America, a considerable number being common to both continents. Some of the genera are remarkable on account of the partial or entire absence of wings. Most of the species feed upon decaying matter, but in a very few cases they are known to be parasitic upon other insects. Others live in ant's nests, some as parasites and others as commensals.

Mr. Brues exhibited a recent book by Baron Osten-Sacken, "A Record of my Life-work in Entomology," and a photograph of the author.

Mr. Davis presented some remarks on *Sympetrum corruptum* in Staten Island and New Jersey. He stated that in 1861 Hagen gave for the United States, western and southern localities for this dragon-fly. In the "Dragon-flies of Indiana" by E. B. Williamson it is recorded from Asia, Mexico, Pennsylvania, Illinois, Kansas, California, Wyoming, Montana, Colorado, Texas, Louisiana and Ohio. In Smith's "List of the Insects of New Jersey" it is only recorded from Eltingville, Staten Island, June 27, 1896. On July 25, 1900, Mr. Davis captured a second specimen at Barnegat, N. J., and this past summer, on August 8, a third example at New Dorp, Staten Island. This last was a female, the other two being males. So far as he was aware, these were the only records for this insect along the Atlantic coast.

Mr. Leng exhibited a series of the larger Coleoptera collected by Professor Wickham chiefly on the eastern slope of the Sierra Nevada, during the summer of 1903. Truckee and Amedee, California, Reno and Humboldt Lake, Nevada, were the places at which the greater part of the time was spent. No *Omus* were taken, the genus being apparently confined to the western slope of the mountains. Cicindelidæ were well represented, also Carabidæ and Tenebrionidæ. The Cicindelidæ of the *willistoni* group found on the shores of the lakes will be referred to later.

Mr. Schaeffer called attention to a specimen of *Heterachthes* which he had received some time ago from Texas and which adds a rather disturbing element to our characterization of the species of *Heterachthes* as it has the tibiæ carinate. The species agrees well with the description of *H. nobilis*; but Le Conte and Horn in their classification state that our species of *Heterachthes* have the tibiæ not carinate. We have seen that the only remaining character to separate two other allied genera, viz, *Compsa* and *Ibidion*, are the carinate or non-carinate tibiæ, and consequently a new genus for this Texas species should be erected or the genus amended to include those species with carinate tibiæ. He further spoke on the genus *Psyrassa* which he said was rejected by Dr. Le Conte in his synopsis of the species of *Elaphidion* because *E. unicolor* was included in the former genus. Bates in the Biol. Cent. Amer. seems to have come to the same conclusion but keeps the genus distinct and proposes to include in *Psyrassa* the elongate species of *Elaphidion* with elongate prothorax and the third joint of the antennæ with a long spine, thus adding again our *E. unicolor*. To this Dr. Horn objected, saying that if we follow this course all of our elongate *Elaphidion* as *aculeatum*, *tenue*, etc., have to be included in *Psyrassa*. Amongst the new species collected in Brownsville, Texas, there are two species which possess more of the characters of *Psyrassa* than of *Elapidion*, especially one of them which is a true *Psyrassa* and for this reason he thinks it more advisable to describe them

under the generic name *Psyrassa* rather than *Elaphidion*. He then showed a few specimens of *Monilema armatum* which he said he could not separate positively, although they differ in the spongy vestiture of the under side of the tarsi, made use of by Dr. Horn in the separation of some species and thought to be constant, but are in his opinion variable. To further illustrate this he exhibited three specimens of *M. gizas*, 2 males and 1 female from Yuma Co., Arizona. One male shows on the first joint of middle tarsi and the second joint of hind tarsi a spongy space only on one side of the joint, another male has a very small additional spongy space on the other side also.

Mr. Bueno exhibited a collection of all of the species of Notonectidæ to be found in the United States and made some remarks concerning some of the species. He stated that there occurred in the United States nine species of the genus *Notonecta* as follows: *Mexicana*, *insulata*, *shooteri*, *indica*, *undulata*, *variabilis*, *uhleri*, *irrorata* and *lutea*. He had found *uhleri* somewhat rare in this locality. In reference to *N. lutea* be stated that its hitherto known habitat was in various parts of northern Europe and Asia but that he had recently received specimens of that species from British Columbia.

The minutes of the preceding meeting were read and approved.

Mr. Davis, chairman of the field committee, made a report concerning the season's excursions. In all five excursions were held as follows: Ft. Lee, N. J., April 19; Patterson, N. J., May 3; Mosholu, N. Y., May 17; Ft. Montgomery, N. Y., May 29–31; and Huguenot, Staten Island, June 14.

The following resolutions were offered by the committee appointed at the last meeting and were unanimously adopted.

"*Resolved*, That the New York Entomological Society receives the tidings of the decease of Augustus Radcliffe Grote, A.M., with profound sorrow; that in his death it recognizes the loss to American Entomology of a most devoted and enthusiastic worker; a man not alone an entomologist but proficient in other branches of science, in literature and art.

"*Resolved*, That a copy of these resolutions be presented to Mrs. Elliman, sister of Mr. Grote, to whom the New York Entomological Society hereby tenders its sincerest sympathy and condolence."

WM. T. DAVIS,
C. F. GROTH,
Com.

Mr. E. D. Harris, 280 Broadway, was elected an active member of the society.

Mr. Leng invited the members of the society to meet at his residence on the afternoon of election day, November 3.

MEETING OF NOVEMBER 17, 1903.

Held at the American Museum of Natural History.

Vice-President Mr. Leng presided with 13 members and 2 visitors present.

The minutes of the preceding meeting were read and approved.

Mr. Schaeffer, the librarian, reported that the following exchanges had been received at the American Museum and transmitted by Mr. Beutenmüller to the librarian:

Entomologiske Middleser, May, Febr., 1903.

Bulletino della Soc. Ent. Italiana, XXXIV, III.

Communicaciones del Museo Nacional de Buenos Ayres, Tom. I, No. 6, pp. 187–190; pp. 206–208.

Verh. d. k. k. Bot. Gesell., LIII, 2, 3, 4.
Boletino Mus. Paraense, Vol. III, 3 and 4.
Tijdschrift voor Entomologie, 1902, 3 and 4; 1903, 1.
Horæ Societatis Entomologicæ Russiæ, XXXVI, 1 and 2.
Bulletin Buffalo Soc. Nat. Hist., VIII, Nos. 1, 2, 3.
Ohio State Acad. of Science, special paper 7.
Cold Spring Harbor Monographs, 1, 2 (Brooklyn Institute).
Melander: Synopsis of the N. A. Species of Ammophila.
Chicago Acad. of Sciences, Vol. II, No. 4; Vol. III, 2; Vol. V.
New Mexico College of Agriculture, Bulls. 44, 45 and 46.
21st and 22d Repts. State Ent. of the State of Illinois.
Proc. Am. Phil. Soc., XLII, 172, 173.
Proc. Am. Acad. Arts and Sciences, XXXVIII, Nos. 20, 21, 22, 23, 24, 25, 26; XXXIX, 1, 2, 3.
Phil. Soc. Wash., XIV, pp. 205–232, 1902.
Ohio Naturalist, Vol. III, Nos. 6 and 8, 1903
Texas Acad. of Sciences, Vol. IV, Pt. 2, Nos. 1, 2, 3, 4, 5, 6, 7, 8.
Melander and Brues: Guests and Parasites of the Burrowing Bee Halictus.
Trans. Connecticut Acad., XI, 1, 2.
West Virginia University Bulletin, 84, 85.
Anales del Museo Nacional de Montevideo, Vol. IV, pp. 29–88, pp. 123–154.

Mr. Engelhardt's paper was postponed until the next meeting of the society.

Mr. Schaeffer then presented a paper on "A Collecting Trip to the Lower Rio Grande." He stated that considérable interest had been awakened concerning the insect fauna of this region by the collections made there by Messrs. Townsend, Schwarz, Wickham, and Dietz. These collections contained a great number of either entirely new species or species known to occur so far only in Mexico and Central America. Prof. Townsend in his paper on the Biogeography of southwestern Texas, Mexico, etc., estimated that only about 25 per cent. of the species known to him belong to the semitropical fauna.

Mr. Schaeffer, in company with Mr. Doll, visited this interesting region during the past summer in the interests of the Brooklyn Museum. He found the conditions for collecting excellent and the vegetation surpassing anything he had expected. They began collecting in the middle of April but were disappointed in the results of their early collecting as they found very little which did not occur later in the season. Mr. Townsend records the palmetto groves as the home of these semitropical species, but Mr. Schaeffer found that they were more abundant in the densely wooded forests of Mexican ebony trees along the banks of the resacas. From his experience he is led to believe that the semitropical insect fauna follows the distribution of the Mexican ebony. In these forests, as well as in the palmetto groves, are found shrubs and even trees heavily overgrown with vines of different species and here are found many insects either hiding between the leaves or feeding upon them, but which are not exclusively found in these masses of vines. He obtained many of the same things from branches of ebony, willow and other trees which were far removed from vine-overgrown bushes. During the hottest part of the day insects were very scarce. The branches of most bushes and trees are armed with spines or thorns which make collecting, especially in the more densely wooded places, very unpleasant. Often

they found it necessary to cut their way through the thick tangled vines by means of the knife. Ticks, which are in places abundant, fleas, jiggers, a small troublesome fly, and frequently mosquitoes were very annoying. Most of the collecting was done at Esperanza Ranch, a place some five miles from Brownsville and the same distance from the river, containing some fine densely wooded localities. Before settling at the ranch they travelled around on horseback collecting here and there. In May a two weeks' trip was made to the coast and the islands, taking in the *Yucca* ridges which are situated between Brownsville and the coast. Although he visited the islands Brazas de Santiago and Padre he found nothing not already recorded by Wickham and Townsend.

Coleoptera is the best represented order in the district of Brownsville and with the addition of this material the number of species will be increased to nearly 800. He found that next to the Coleoptera, the Hemiptera were most abundant in individuals but not in species. Hymenoptera were more abundant than Diptera. Odonata were poorly represented. Adult stages of Orthoptera were scarce owing probably to the great abundance of birds and spiders. To this cause also was probably due the scarcity of caterpillars and other soft-bodied insects. At a rough guess Mr. Schaeffer estimates that as a result of his three months' collecting, he has brought home between 700 and 800 species of Coleoptera, of which 80 are new to our list and about one half of the 80 are new species.

Mr. Barber presented a few remarks on Mr. Bueno's "List of the Pentatomidæ within Fifty Miles of New York City" which was published in the last number of the N. Y. JOURNAL. Among other things he stated that such a fragmentary list had very little value unaccompanied by any remarks for identification of the species. Prof. J. B. Smith in his New Jersey list mentions over twice as many species occurring within the same limits. He mentioned that the taking of *Brochymena annulata*, at Lakehurst, N. J., was of interest. He also remarked that there was considerable confusion in reference to the identity of the three species of *Brochymena* occurring in this locality (*B. annulata*, *B. quadripustulata* and *B. arborea*) and added tables for their proper identification.

Mr. Leng spoke of the rare beetles from Lakehurst, N. J. He briefly described the place, mentioning the flat sandy country, the forests of small oaks and pines, the sandy wood-roads, the sphagnum swamps with their growth of white cedar and the cranberry bogs. He also referred to the boarding house of Mrs. Henry P. Taylor, which has usually been the headquarters of visiting entomologists.

Mr. Leng exhibited a few beetles taken at Lakehurst, and spoke especially of *Cicindela consentanea*, recently found in abundance by Mr. Harris, *Pasimachus depressus* found by Mr. Davis, *Exochomus septentrionis* found by Mr. Barber, *Agabus tæniolatus* found by Mr. Roberts, *Eros aurora*, *Cremostochilus harrisii*, *Polypleurus perforatus*, *Scymnus liebecki*, etc. In conclusion he said that while the total number of species living at Lakehurst might not prove unusually large, the number of species peculiar to the region would be sufficient to make it always a desirable collecting ground.

Mr. Davis exhibited the type of *Neoclytus joutelii*, a new species of longhorn beetle found last summer at Lakehurst.

Mr. Roberts made some remarks in reference to the rare water beetles he had secured at Lakehurst. He secured 42 species of Dytiscidæ from one pool.

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Class I, HEXAPODA.

Order I, HYMENOPTERA.

DESCRIPTIONS OF NEW HYMENOPTERA FROM JAPAN.—I.*

By William H. Ashmead, M.A., D.Sc.,

Washington, D. C.

For several years past I have been classifying, arranging and determining the Japanese Hymenoptera in the National Museum, presented by several valued correspondents, among whom special mention should be made of Dr. Mitsukuri, of Tokyo, Mr. Y. Nawa, of Gifu, Dr. Matsumura, of Sapporo, and Mr. A. Koebele, now government entomologist of the Hawaiian Islands, whose contributions are of especial value and contain many new species, particularly among the parasitic families.

The new species in the superfamilies Sphecoidea, Vespoidea, Proctotrypoidea, Cynipoidea and Chalcidoidea are treated here. Those in the Ichneumonoidea and other superfamilies will be described in another paper.

Superfamily II, *SPHECOIDEA.*

Family XVI, CRABRONIDÆ.

Genus CLYTOCHRYSUS Morawitz.

Clytochrysus dubiosus, new species.

Female. — Length, 12 mm. Black; the mandibles, except at apex, the scape, except a line above, all tarsi, the superior edge of the pronotum, emarginate at the

* These papers contain descriptions of 115 new species from Japan, two from Formosa and one from China, one new genus and notes on five previously described species.

middle, a band at the base of the second dorsal segment, an oblong, oblique spot at the sides of the third and fourth segments, and a band at the base of the fifth segment, yellow; wings hyaline, the stigma and veins yellowish.

The head and the thorax are closely, finely punctured, opaque, the metathorax almost smooth, shining, with a few coarse transverse ridges or folds at the extreme apex, and a deep central furrow; the clypeus has a median ridge, and is clothed with a dense silvery white pubescence; the third joint of the antennæ is about as long as joints 4 and 5 united; while the abdomen is smooth and shining, impunctate, the pygidium being subogival, with fine lines laterally and at apex, the disc concave.

Male. — Length, 11 mm. Agrees well with the female, except that the abdomen is somewhat slenderer, the pygidium rounded at apex, convex above, the mandibles black, bidentate, with a broad yellow stripe within, the front femora and tarsi beneath and anteriorly, the middle and hind tibiæ beneath and the basal joint of middle tarsi are yellow: hind tarsi black.

Type. — No. 7108, U. S. National Museum.

Japan (Dr. Mitsukuri).

Family XX, PHILANTHIDÆ.

Genus CERCERIS Latreille.

Cerceris japonica, new species.

Female. — Length, 10 mm. Black, strongly, coarsely punctate; the mandibles, the face, including clypeus, to base of antennæ, and the orbits nearly to the apex of the eyes, the scape of antennæ, except a line above, two small spots on the pronotum, the postscutellum, two oval confluent spots at base of second dorsal abdominal segment, a very large spot on each side of the third segment, and a band at the apex of the fifth segment dilated laterally, all yellow. Wings hyaline, faintly dusky at apical margins, the stigma and costal vein yellowish, the other veins fuscous. Legs mostly yellow, with all coxæ more or less, the front and middle femora *above*, the hind femora entirely, a spot on hind tibiæ within at apex and the hind tarsi, black.

Type. — No. 7109, U. S. National Museum.

Japan (Dr. Mitsukuri).

Cerceris quinquecincta, new species.

Male. — Length, 11 mm. Agrees well with *C. japonica*, except as follows; the scape and pedicel, except a stripe above, are yellow; the hind coxæ, except at base, their trochanters, basal half of their femora and base of their tibiæ are yellow; while the abdominal segments 2–6 are banded with yellow at apex, the first segment with two yellow spots.

Type. — No. 7738, U. S. National Museum.

Japan (Dr. Mitsukuri). Described from a single specimen. This species may yet prove to be the male of *C. japonica*.

Superfamily III, *VESPOIDEA*.

Family XXXII, BETHYLIDÆ.

Genus EPYRIS Westwood.

Epyris atamensis, new species.

Female. — Length, about 3 mm. Black, the head minutely closely punctate, the pronotum sparsely punctate; mandibles, palpi, the apical third of the scape, the flagellum and the legs, brownish-yellow, the femora more or less dusky, the front femora brown. Wings subfuscous, the venation pale brown.

The antennæ are somewhat stout, 13-jointed, the scape long, a little more than four times as long as thick; the first joint of the flagellum is a little longer than thick, more slender than the following joints; joints 2–10 wider than long. The mesonotum is without a trace of the parapsidal furrows, the scutellum with a transverse furrow across the base, while the metanotum has some elevated longitudinal lines. The abdomen is conically pointed, highly polished, but clothed with some sparse white hairs, the second segment being the longest, about one half longer than the third.

Type — No. 7110, U. S. National Museum.

Atami (Mr. A. Koebele). One specimen.

Genus GONIOZUS Förster.

Goniozus japonicus, new species.

Female. — Length, 2.5–3 mm. Black and shining; the head with some sparse, microscopic punctures; mandibles, palpi, antennæ, trochanters, tibiæ and tarsi, yellow or brownish-yellow, the coxæ and femora black or fuscous black. Wings hyaline, the parastigma and stigma brown, the other veins pale yellowish, the basal nervure with a branch not quite as long as its first abscissa, or the part between the branch and the median vein.

The prothorax has fine, longitudinal lineations on each side, the metathorax has the sides coriaceous, but has some elevated lines above, while the abdomen is pointed and highly polished.

Type. — No. 7111, U. S. National Museum.

Gifu (Y. Nawa).

Superfamily V, *PROCTOTRYPOIDEA*.

Family LII, PROCTOTRYPIDÆ.

Genus PROCTOTRYPES Latreille.

Proctotrypes scymni, new species.

Female. — Length, 3 mm. Polished black, the metathorax rugulose, without carinæ, the cauda not longer than the basal joint of the hind tarsi, or hardly so long; antennæ and legs brownish-yellow, the former faintly dusky toward apex; the second joint of the middle trochanters is produced at apex into a little tooth; wings clear hyaline, without a trace of internal veins, the subcostal vein, stigma and radius brown.

The antennæ are distinctly 13-jointed, filiform, the flagellar joints all cylindrical, the first the longest joint but only slightly longer than the second and slightly narrowed towards base, the second joint being fully four times as long as thick, or a little longer, the joints beyond gradually shortening to the last, the last being longer than the penultimate, or nearly as long as the first joint.

Male. — Differs from the female only in having the abdomen forked at apex, the antennæ longer, with the flagellum, except the first joint at base, wholly black or brown-black, the joints being a little longer, clothed with a fine, short pubescence.

Type. — No. 7113, U. S. National Museum.

Japan (Albert Koebele); Gifu (Y. Nawa).

The specimens from Mr. Koebele were bred from the woolly larvæ of a Coccinellid, *Scymnus dorcadomordes* Weise. Mr. Nawa has also bred it from a *Scymnus* larva.

Proctotrypes japonicus, new species.

Male. — Length 6 mm. Polished black; pedicel and the ring-joint reddish; palpi yellowish; legs black, the sutures of the trochanters, tips of femora, and the tibiæ and tarsi, flavo-testaceous; metathorax except a smooth space at base, rugulose, with a median carina which becomes obsolete on the posterior face. Wings hyaline, the stigma, costal and radial veins black or brown-black, the subcostal vein pale; the internal veins are wanting or indicated by brownish streaks. The antennæ are black, with the scape beneath and the pedicel yellowish.

Type. — No. 7114, U. S. National Museum.

Sapporo (Dr. Matsumura).

Family LIII, BELYTIDÆ.

Genus MIOTA Förster.

Miota hakonensis, new species.

Female. — Length, 3.6 mm. Polished black; first three or four joints of antennæ, the tegulæ, and the legs, except the hind coxæ, yellow or brownish-yellow, the flagellum, after the first joint, brown.

The antennæ are long, filiform, 15-jointed, the scape fully as long as the first and second joints of the flagellum united and stouter; all the joints of the flagellum are cylindrical; the first joint of the flagellum is a little longer than the second and the longest joint, being about five times as long as thick; the following joints to the last gradually become shorter and shorter, the penultimate being only a little more than twice as long as thick. The abdominal petiole is long, fully twice as long as the metathorax and delicately, longitudinally striated or aciculated, the rest of the abdomen being smooth and highly polished.

Type. — No. 7115 U. S. National Museum.

Hakone (Mr. A. Koebele).

Family LIV, DIAPRIIDÆ.

Subfamily I, SPILOMICRINÆ.

Genus SPILOMICRUS Westwood.

Spilomicrus japonicus, new species.

Male. — Length, 3.6 mm. Polished black, the prothorax at sides *below* and the lower part of the mesopleura striated, the metathorax rugulose, the abdominal petiole long, longitudinally furrowed; antennæ longer than the body, reddish-brown, pubescent, the flagellar joints all long, cylindrical, except the first joint which is hardly one fourth the length of the second; the second joint is about seven times as long as thick, with an emargination beneath at basal fourth. Wings hyaline, faintly tinted, the marginal vein and the short radius brown-black, the former being about four times as long as thick, the radius hardly half its length, with a ray or short fuscous branch from its tip, obliquely directed inwardly, nearly parallel with the basal nervure. Under a strong lens one may also detect a delicate fuscous ray from the tip of the radius, directed outwardly and forming a long, narrow marginal cell.

Type. — No. 7116, U. S. National Museum.

Sapporo (Dr. Matsumura).

Subfamily II, DIAPRIINÆ.

Genus DIAPRIA Latreille.

Diapria mitsukurii, new species.

Female. —Length, 2 mm. Polished black, impunctate, the cheeks posteriorly, the collar at the sides, the metathorax and the petiole clothed with a glittering white pubescence, denser on the cheeks and collar; head subglobose; legs, including coxæ, brownish-yellow; antennæ 12-jointed, ending in a 5-jointed club but which is not abruptly defined, the club-joints gradually enlarging from the first, which is only about twice as thick as the last funicle joint; the antennæ, except the club, are honey-yellow, the club black; the pedicel is as long as the first funicle joint but much thicker; the funicle is 5-jointed, the joints gradually decreasing in size, the last being hardly twice as long as thick at apex; the scutellum has a rather large, transverse fovea at base; the metathorax has a sharp median ridge at base which, when seen from the side, is triangular; abdomen pointed ovate, highly polished, the petiole alone sculptured or striate; the petiole is fully twice as long as thick and so densely clothed with a whitish pubescence that its sculpture is obscured.

Male. — Differs from female in having the antennæ long, 14-jointed, the flagellar joints ellipsoidal, subpetiolate, with long hairs, the second being shorter than the first, dentate beneath.

Type. — No. 7117, U. S. National Museum.

Gifu (Dr. Mitsukuri).

Family LV, CERAPHRONIDÆ.

Subfamily I, MEGASPILINÆ.

Genus LYGOCERUS Förster.

Lygocerus japonicus, new species.

Female. — Length, 2 mm, Black, the head and thorax above, alutaceous, subopaque, the sides of the thorax highly polished, shining; antennæ 11-jointed black, the scape long, about half the length of the flagellum, the pedicel obconical, the first joint of the flagellum long, cylindrical, about four times as long as thick at apex, or a little longer, the second joint about half as long as the first and a little shorter than the third, joints 3–8 nearly equal in length, about twice as long as thick, the last fusiform; legs reddish-brown, the trochanters, knees, front tibiæ and tarsi, and middle tibiæ *beneath* and their tarsi, yellowish. Wings hyaline, the stigma and veins reddish-brown.

Type. — No. 7118, U. S. National Museum.

Atami. Described from two specimens labelled No. 1287, bred by Mr. A. Koebele from an Aphis, *Lachnus* sp., found on Pine.

Lygocerus koebelei, new species.

Female — Length, 1.5 mm. Very similar to *L. japonicus*, but smaller, the sutures of the trochanters, knees, front tibiæ and tarsi, and the extreme tips of middle and hind tibiæ, pale yellowish; the flagellum is very slightly thickened toward apex, the first joint not more than thrice as long as thick, a little longer than the second, the latter being a little longer than the third, while the joints beyond to the last are only about one and one half times as long as thick.

Male. — Differs from the female in having the scape of the antennæ, except the extreme apex, and the legs brownish-yellow, the flagellum being much longer, pilose, with the joints 1–4 excised at apex, appearing when viewed from side, as if dentate.

Type. — No. 7119, U. S. National Museum.

Atami. Described from 4 ♀ and 2 ♂ specimens bred by Mr. A. Koebele from an unknown Aphis.

Genus DENDROCERUS Ratzeburg.

Dendrocerus ratzeburgi, new species. (Plate VII, Fig. 1.)

Male. — Length, 1.5 mm. Black; legs, except the middle femora and the hind legs, brownish-yellow, the middle femora brownish, the hind legs, except trochanters, knees and tibial spurs, which are yellowish, black. Antennæ black, with the flagellar joints 1 to 5 each with a long, filiform or thread-like pubescent branch, the first three or four being nearly twice as long as the scape; the first joint of the flagellum is only a little longer than thick, the following to the sixth increasing in length, joints 7 to last thickened, three or more times longer than thick. Wings hyaline, the stigma and veins brown.

Female. — Length, 1.8 mm. Black; legs wholly brown, except the articulations which are yellowish; antennæ as long as the body, black except the scape at the

extreme base. The scape has a little tooth at the basal third beneath, a character not found in *Lygocerus*.

Type. — No. 7120, U. S. National Museum.

Atami. Described from a ♂ and ♀ specimen bred by Mr. A. Koebele from an Aphis.

In my generic table of the *Megaspilinæ* I find I have incorrectly placed this genus in the section *without* mesonotal furrows, not having seen a representative of the genus, depending entirely upon Ratzeburg's brief description and figure in placing it.

Subfamily II, CERAPHRONINÆ.

Genus APHANOGMUS Thomson.

Aphanogmus hakonensis, new species.

Female. — Length, 0.8 mm. Head and thorax black, subopaque, the mesopleura delicately longitudinally aciculate and shining; antennæ 10-jointed, light brownish, with the three last joints black, the scape towards apex and the pedicel yellow; the flagellum is gradually thickened towards apex, the joints subquadrate in outline, the last joint large, ovate; mesonotum without a median furrow. Wings hyaline, the veins brownish. Abdomen ovate, highly polished, except some longitudinal striæ at base above.

Type. — No. 7121, U. S. National Museum.

Hakone. Described from a single specimen collected by Mr. A. Koebele.

Family LVI, SCELIONIDÆ.

Subfamily I, TELENONINÆ.

Genus TELENOMUS Haliday.

TABLE OF SPECIES.

1. Second abdominal segment about twice as wide, as long or nearly so..... 2.
 Second abdominal segment as long or longer than wide..... 6.
2. Pedicel of antennæ not shorter than the first joint of the funicle (none known from Japan).
 Pedicel of antennæ distinctly shorter than the first joint of the funicle..... 3.
3. Thorax smooth or nearly, at the most with exceedingly minute, scattered punctures..... 4.
 Thorax distinctly punctate, sometimes rugo-punctate, or rugulose..... 5
4. Legs black or brown-black, the trochanters, tips of femora, tips of tibiæ and all tarsi yellow. (Length, 0.70 to 0.75 mm.)**T. atamiensis.**
 Legs except coxæ, yellow, the hind femora and tibiæ medially sometimes tinged with brown. (Length, 0.45 to 0.50 mm.).....**T. nawai.**
5. Legs, except coxæ, and the first six joints of the antennæ brownish-yellow, the rest

of the antennæ black; flagellum short, joints 4 to 6 wider than long; head finel. punctulate, the thorax rugulose. (Length, 1.3 to 1.6 mm.).....**T. mitsukurii**

Legs, except coxæ, brownish-yellow, the antennæ, except the scape, brown-black; flagellum long, joints 4 to 6 longer than wide; head smooth, impunctate, the thorax finely punctulate, the scutellum smooth. (Length, 1.3 mm.)

T. hakonensis.

6. Thorax sparsely, microscopically punctate.

Legs and scape of antennæ yellow, the flagellum not short, brown. (Length, 1.4 to 1.5 mm.).....**T. gifuensis.**

Telenomus atamiensis, new species.

Male. — Length, 0.70–0.75 mm. Black and shining, the head smooth, impunctate, wider than the thorax, about 3½ times as wide as thick, antero-posteriorly, the eyes light-colored, the mesonotum with a few very minute scattered punctures; flagellum dark brown, pubescent, the scape and the pedicel except at extreme apex which is yellowish, black; wings hyaline, pubescent, the veins brown, the marginal vein very short, only about one third the length of the stigmal vein which ends in a small knob; abdomen short oval, hardly longer than the thorax, depressed, smooth and shining, except the first segment which is delicately striated; legs black or brown-black, the trochanters, tips of femora, tips of tibiæ and all tarsi yellow.

Type. — No. 7122, U. S. National Museum.

Atami. Two specimens collected by Mr. A. Koebele.

Telenomus nawai, new species.

Female, male. Length, 0.45–0.50 mm. Black and shining, impunctate, the head about 3 times as wide as thick antero-posteriorly; antennæ light brown, the scape yellowish; wings hyaline, the veins pale, the marginal vein nearly punctiform, only a little longer than thick; abdomen broadly oval, not longer than the thorax, smooth and shining; legs pale yellow, the hind femora and tibiæ medially sometimes tinged with brown.

The male is easily known by the 12-jointed filiform antennæ, the flagellar joints from the third to the last are moniliform, the second being longer than thick. Some specimens measure only 0.30 mm. in length.

Type. — No. 7123, U. S. National Museum.

Gifu. Described from 18 specimens bred by Mr. Y. Nawa from the eggs of an unknown Lepidopteron.

Telenomus mitsukurii, new species.

Female. — Length, 1.3–1.6 mm. Black, the head finely punctulate, smoother and shining in front, the thorax finely rugulose, opaque, finely pubescent; legs, except coxæ, and first six joints of the antennæ brownish-yellow, the rest of the antennæ black or brown-black; abdomen broadly oval, a little shorter than the thorax, depressed, smooth and shining; wings hyaline, pubescent, the veins light brown or brownish-yellow.

Type. — No. 7124, U. S. National Museum.

Atami and Hakone. Described from 5 specimens collected by Mr. A. Koebele.

Telenomus hakonensis, new species.

Female. — Length, 1.3 mm. Black, the head smooth and shining, impunctate, the thorax finely punctulate, finely pubescent, but with the scutellum smooth and shining; legs, except coxæ, and the scape of the antennæ brownish-yellow, rest of antennæ brown-black; abdomen oval, as long as the thorax, smooth and shining; wings hyaline, pubescent, the veins yellowish.

Type. — No. 7125, U. S. National Museum,

Hakone. Described from two specimens collected by Mr. A. Koebele.

Telenomus gifuensis, new species.

Female. — Length, 1.4–1.5 mm. Black, the head on vertex and thorax above, except the scutellum, finely microscopically punctulate, the head in front and the scutellum smooth and shining; scape of antennæ and the legs, including coxæ, yellow or light brownish-yellow; abdomen polished, the petiole and the extreme base of the second segment striated; flagellum black or brown-black, the first joint the longest, three or more times longer than thick, much longer than the pedicel, the second joint shorter than the first, the third oblong, only a little longer than thick, the fourth rounded, the club 5-jointed, joints 1 to 4 a little wider than long.

Type. — No. 7126, U. S. National Museum.

Gifu. Described from many specimens mounted on card-board and labelled No. 74, received from Mr. Y. Nawa.

Genus DISSOLCUS Ashmead.

Dissolcus japonicus, new species.

Female. — Length, 1 mm., black, the head shining with some sparse punctures, the thorax opaque, sericeous, minutely closely punctate, with two grooved furrows on the mesonotum; antennæ brown-black, the scape beneath at base and the extreme apex of the pedicel yellowish; legs black, the tibiæ brownish-yellow, the tarsi pale yellowish; wings hyaline, pubescent, the veins light brownish-yellow; abdomen broadly oval, polished, the first segment and the second basally longitudinally striated.

Type. — No. 7127, U. S. National Museum.

Hakone. Described from a single specimen taken by Mr. A. Koebele.

Dissolcus flavipes, new species.

Female. — Length, 1 mm. Black, impunctate, shining; antennæ brown-black, the tip of the pedicel and joints 3 and 4 of funicle yellow; legs wholly yellow; wings hyaline, pubescent, the veins brown, the postmarginal vein wanting, the stigmal vein short; abdomen oval smooth and shining, the first and second segment at base striate.

Type. — No. 7128, U. S. National Museum.

Hakone. Described from one female collected by Mr. A. Koebele.

Subfamily IV, SCELIONINÆ.

Genus HADRONOTUS Förster.

Hadronotus japonicus, new species.

Female. — Length, 1 mm. Black, coarsely rugulose; scape and pedicel of antennæ and the legs, except the coxæ, rufu-testaceous, flagellum brown-black; abdomen oval, feebly shagreened, subopaque; wings hyaline, the veins brown, the marginal vein short only about twice as long as thick.

Type. — No. 7129, U. S. National Museum.

Japan. Described from one specimen collected by Mr. A. Koebele.

Hadronotus hakonensis, new species.

Female. — Length, 1.5 mm. Black, coarsely rugulose, the abdomen finely rugulose, the apex of the segments smooth and shining; legs, except coxæ, flavo-testaceous, the femora basally brownish; antennæ, except the club, brownish-yellow, the pedicel brownish above; wings hyaline, pubescent, the veins brown, the subcostal veins more or less pale yellowish.

Type. — No. 7305, U. S. National Museum.

Hakone. Described from a single specimen collected by Mr. A. Koebele.

Family LVII, PLATYGASTERIDÆ.

Subfamily I, INOSTEMMINÆ.

Genus Allotropa Förster.

Allotropa japonica, new species.

Female. — Length, 0.8 mm. Black, the head and thorax, except the scutellum, faintly alutaceous, the scutellum polished, shining; antennæ yellowish, the scape towards apex and the club, brown or dusky, the club 4-jointed, the pedicel fully thrice as long as thick at apex, stouter than the funicle joints, the latter slender, the first joint the longest, the second and third small, short; legs yellowish, the coxæ, all femora and the hind tibiæ and tarsi brown. Wings hyaline, the submarginal vein light brown, ending in a small knob.

Male. — Length, 0.6 mm. Agrees with the female, except in its antennæ, which are 9-jointed, the flagellar joints nodose, briefly pedicellate, with long hairs.

Type. — No. 7130, U. S. National Museum.

Japan. Described from a female and male specimen, labelled No. 1266 and 1267, bred by Mr. A. Koebele from an unknown Cecidomyiid gall.

Subfamily II, PLATYGASTERINÆ.

Genus AMBLYASPIS Förster.

Amblyaspis japonica, new species.

Female. — Length, 0.8 mm. Polished black; antennæ, except the club which is black, brownish yellow, the scape yellowish beneath; legs piceous black, the

front legs, except the femora basally, the trochanters of the middle and hind legs, and the basal half of the tibiæ and the tarsi, yellow. Wings clear hyaline. Abdomen polished black, except the petiole which is longitudinally striate and has a minute yellow spot at base above.

The scutellum is triangularly pointed, a little longer than wide at base, the extreme apex piceous; the pedicel is long, slender, about three times as long as thick at apex, the funicle joints 1 and 2 also slender, the second long, cylindrical twice as long as the first, the latter being shorter than the pedicel, joints 3 and 4 small, not longer than thick, but a little thicker than the first; club abruptly defined, 4-jointed, the joints much wider than the funicle, the first three joints nearly as wide as long.

Type. — No. 7131, U. S. National Museum.

Atami. One specimen collected by Mr. A. Koebele.

Genus SACTOGASTER Förster.

Sactogaster hakonensis, new species.

Female. — Length, 1 mm. Black, the head and thorax feebly, microscopically shagreened, subopaque, the pleura and the abdomen polishing, shining; antennæ brown-black, the scape beneath and at base flavo-testaceous; legs black, all tibiæ toward base, and all tarsi, except the last joint, yellowish; mesonotum without complete parapsidal furrows, but with a trace of them posteriorly for two thirds the length of the mesonotum; scutellum produced into a thorn-like spine at apex, with some glittering white hairs on either side at apex; abdomen with a whitish pubescence at base, the tail-like projection, which is formed by segments 3 to 6 being much narrowed, is as long as the second segment, the sixth segment being about as long as segments 3 to 5 united, the fifth a little longer than the fourth, the third hardly half as long as the third.

Type. — No. 7132, U. S. National Museum.

Hakone. One specimen collected by Mr. A. Koebele.

Genus ANOPEDIAS Förster.

Anopedias japonicus, new species.

Female. — Length, 0.7 mm. Polished black, the flagellum testaceous, yellowish at base, the trochanters, base of all tibiæ and the apex of the front tibiæ honey-yellow, the tarsi, except the last joint, yellowish-white, the metapleura and the base of the abdomen clothed with a silvery-white pubescence. Wings clear hyaline, faintly pubescent. The antennæ are folded and so covered with glue that they cannot be described in detail.

Type. — No. 7133, U. S. National Museum.

Hakone. One specimen collected by Mr. A. Koebele.

Genus POLYGNOTUS Förster.

Polygnotus gifuensis, new species.

Male. — Length 1.6 mm. Polished black, the mesonotum without parapsidal furrows; legs, except tips of front femora, front tibiæ and tarsi, which are testaceous,

wholly black; antennæ, except the extreme apex of the scape and the pedicel which have a testaceous tinge, black; the flagellum is filiform, the first joint very minute, rounded, the second larger, globular, the following to the last oblong, longer than thick, about 1½ times as long as thick, the last joint ovate.

Type. — No. 7134, U. S. National Museum.

Gifu. Described from four male specimens, labelled No. 74, received from Mr. Y. Nawa.

Superfamily VI, *CYNIPOIDEA.*

Family LVIII, FIGITIDÆ.

Subfamily I, ONYCHIINÆ.

Genus ONYCHIA Haliday.

Onychia japonica, new species.

Female. — Length 5–5.5 mm. Black, the scutellum with a yellow spot on each side towards the base, the front tibiæ toward base and beneath, the front tarsi, joints 2–4 of middle tarsi and joints 2–4 of the hind tarsi, yellowish. The head and thorax are shagreened, opaque, and more or less transversely rugulose; ocelli yellowish, the front ocellus placed in a smooth depression, surrounded by a delicate carina; eyes brown; antennæ long, about two thirds the length of the body, black, the first joint of the flagellum the longest joint, the last joint the next longest, only a little shorter than the first but almost as long as the two preceding joints united; middle carina of the mesonotum forked at apical third, the cell thus formed finely transversely rugulose. Wings hyaline, glabrous or nearly, the veins pale yellowish, the costal and marginal cells confluent. The metathorax is rugulose and pubescent with sometimes a yellowish spot where the petiole is attached. The abdomen is polished black, ovate, shorter than the thorax, the petiole opaque, aciculated.

Male. — Agrees well with the female except that the antennæ are 14-jointed, fully as long as the body, the joints longer proportionally, cylindrical; the first flagellum joint is not longer than the second, subemarginate outwardly at basal half; the veins of the front wings are tinged with brown, while the abdomen is more obtuse at apex than in the female.

Type. — No. 3135, U. S. National Museum.

Atami, Hakone and Nikko. Described from one male and four female specimens collected by Mr. A. Koebele.

Subfamily III, ANACHARINÆ.

Genus XYALASPIS Hartig.

Xyalaspis atemiensis, new species.

Female. — Length, 2.8 mm. Black, with yellow mandibles, the antennæ and the legs, except coxæ, hind femora basally and hind tarsi, brownish-yellow, the scape towards base and the flagellum towards apex are dusky; the coxæ, hind femora

basally, tips of hind tibiæ and their tarsi are fuscous or blackish. Wings hyaline, the veins yellowish. The antennæ are 13-jointed, nearly as long as the body, the flagellum very slightly and gradually thickened towards apex, the last joint being nearly as long and as thick as the scape, but hardly as long as the two preceding joints united. Head smooth, polished, except a few wrinkles on the cheeks; thorax mostly smooth, but with the pronotum, the scutellum and the metathorax rather coarsely rugulose, the scutellum ending in a blunt spine. Abdomen polished black, except beneath towards base, where it is piceous or rufo-testaceous; the petiole is short and striated.

Type. — No. 7136, U. S. National Museum.

Atami. Described from two female specimens collected by Mr. A. Koebele.

Subfamily VI, XYSTINÆ.

Genus XYSTUS Hartig.

Xystus japonicus, new species.

Male. — Length, 1.1 mm. Wing expanse about 3.8 mm. Head yellow, the eyes black; thorax brownish-yellow, the mesonotum with a median streak and a lateral spot towards each tegula, and the disk of the scutellum dark brown; abdomen black, beneath and at apex yellowish. Wings hyaline, the venation, except the costæ basally which are yellowish, light brownish. The antennæ are longer than the whole insect, 14-jointed, the basal third yellow, the apical two thirds dusky or brownish, joints 2 and 3 slightly curved, about equal in length and only a little shorter than the first, a little more than four times as long as thick, the joints beyond cylindrical, very imperceptibly shortening to the last, which is only a little more than twice as long as thick.

Type. — No. 7137, U. S. National Museum.

Japan. Received from Mr. A. Koebele, labelled No. 1268 and bred from an Aphis.

Family LIX, CYNIPIDÆ.

Subfamily I, SYNERGINÆ.

Genus SYNERGUS Hartig.

Synergus atamiensis, new species.

Female. — Length, 3.5 mm. Black, the head and thorax coarsely rugulose, the disk of the mesonotum transversely rugulose, the mesopleuræ with longitudinal striæ, the scutellum rugulose, with a median impression at apex; abdomen, except the petiole, smooth and shining; antennæ 14-jointed, entirely pale yellowish; legs, except the coxæ, base of front femora and the middle and hind femora which are black or brown-black, flavo-testaceous, the hind tibiæ, except at base and apex, fuscous; wings hyaline, the veins light brown.

Type. — No. 7306. U. S. National Museum.

Atami. Described from two specimens collected by Mr. A. Koebele.

Synergus gifuensis, new species.

Female. — Length, 3 mm. Black, the head and thorax rugulose, the disk of the mesonotum with fine, transverse rugæ, the scutellum finely, closely punctate, convexly rounded, without a median impression towards apex; abdomen smooth and shining, the sheaths of the ovipositor very briefly projecting beyond its tip; antennæ and legs brownish-yellow, the pedicel basally brown, the coxæ and hind femora, except at apex, black, the hind tibiæ and the basal joint of their tarsi, light brown; wings hyaline, the veins yellowish. The antennæ are long, 14-jointed.

Type. — No. 7307, U. S. National Museum.

Gifu. Described from three specimens, labelled No. 43, received from Mr. Y. Nawa.

Synergus hakonensis, new species.

Female. — Length, 1.8 mm. Black, the head and thorax finely rugulose, with transverse rugæ on the lobes of the mesonotum, the scutellum punctate-rugose, convexly rounded, the mesopleura shining but with some longitudinal striæ; abdomen black and shining, the sheaths of the ovipositor not at all projecting; antennæ and legs, except the coxæ and femora, pale yellow, the front and middle coxæ, middle and hind femora, except at apex, brownish-piceous, the hind coxæ black; wings hyaline, the veins pale yellowish. The antennæ are 13-jointed.

Type. — No. 7307, U. S. National Museum.

Hakone. Described from a single specimen collected by Mr. A. Koebele.

Synergus japonicus, Walker.

Dr. Mitsukuri has sent eight specimens of this species taken, I believe, by Mr. Nawa, at Gifu.

Genus CEROPTRES Hartig.

Ceroptres japonicus, new species.

Male. — Length, 2 mm. Black, shining, the head and thorax finely pubescent, the head smooth, impunctate; antennæ and legs brownish yellow, the hind coxæ black or dusty, the hind tibiæ and tarsi more or less fuscous. Wings hyaline, the veins brownish. The antennæ are 13-jointed, cylindrical, the third joint the longest, the fourth only two thirds the length of the third, the following to the last very imperceptibly shortening, the last long, nearly as long as the third.

Type. — No. 7138, U. S. National Museum.

Gifu. Described from three male specimens, received from Mr. Y. Nawa, who bred them from a bud-like gall on oak, irregularly rounded, depressed, about 3 mm. in diameter and of a dark brownish-black color. The gall is mounted on card-board, with the wasps, and I cannot tell whether it is a bud-gall, a leaf-gall, or a twig-gall. It may be produced by one of the genuine gall-wasps described below under the genera *Neuroterus*, *Dryophanta*, or *Callirhytis*.

Subfamily II, CYNIPINÆ.

Tribe I, CYNIPINI.

Genus NEUROTERUS Hartig.

Neuroterus nawai, new species.

Female. — Length, 1.9 mm. Polished black; mandibles, palpi, four or five basal joints of antennæ, and the legs pale yellowish or luteous, the apical two thirds of the antennæ brownish. Wings hyaline, the veins brown, the radius pale towards apex; the marginal cell is long, about five times as long as wide at base. The antennæ are 14-jointed, nearly as long as the body, the third joint the longest, nearly five times as long as thick, the following very slightly decreasing in length to the last, the penultimate being not more than twice as long as thick.

Male. — Length, 1.7 mm. Distinguished at once from the female by the small compressed, triangularly-shaped abdomen, which is distinctly petioled, the petiole being nearly as long as the hind coxæ, by the antennæ which are longer than the body, brown-black, except the first three joints which are yellow, the third joint being excised towards basal half, and by the color of the legs which are straw yellow, with the hind coxæ basally and the apical two thirds of the hind tibiæ dusky or brownish.

Type. — No. 7139, U. S. National Museum.

Gifu (Y. Nawa); Hakone (A. Koebele).

Neuroterus atamiensis, new species.

Female. — Length, 1.1 mm. Polished black; antennæ, except a pale annulus at base of the third joint, wholly black; legs piceous black, the sutures of the joints alone pale. Wings hyaline, the veins brownish-piceous, the marginal cell very long, more than six times longer than wide at base.

Type. — No. 7140, U. S. National Museum.

Atami. Described from a single specimen taken by Mr. A. Koebele.

Neuroterus hakonensis, new species.

Female. — Length, 1.6 mm. Black and shining, impunctate; first four or five joints of the antennæ and the legs, including coxæ, brownish-yellow, the rest of the antennæ fuscous; wings hyaline, the veins, except the basal nervure and the apex of the first abscissa of the radius which are brown, pale yellowish. The antennæ are 14-jointed, not quite as long as the body, the second and third joints (an unusual character in this genus) about equal in length and only about four times as long as thick.

Type. — No. 7309, U. S. National Museum.

Hakone. Described from four specimens collected by Mr. A. Koebele.

Genus DRYOPHANTA Hartig.

Dryophanta japonica, new species

Female. — Length, 3 mm. Polished black, shining, the head on the vertex alutaceous; two basal joints of antennæ, a very narrow annulus at apex of the first

and second joints of the flagellum, the mandibles, except teeth, the extreme apex of the cheeks where the mandibles are attached, and the legs, except the coxæ, honey-yellow; the flagellum, except as already noted, is black, the first joint the longest, one third longer than the second, the following to the sixth gradually decreasing in length, joints 7 to 11, scarcely longer than thick, the twelfth or last antennal joint fusiform, longer than the penultimate; wings hyaline, very long, the veins dark brown.

Type. — No. 7141, U. S. National Museum.

Japan (exact locality not stated). Described from a single specimen collected by Mr. A. Koebele.

Dryophanta serratæ, new species.

Gall. — An irregular globular gall from 8–10 mm. in diameter, covered with numerous thread-like, fibrous filaments, each filament being densely clothed with a grayish or whitish wool-like substance.

Gall-wasp. Female. — Length, 3 mm. Head and thorax shagreened, light-brown, pubescent, the head more yellowish, the mesothorax with four black glabrous lines, two on the middle lobe and one on each lateral lobe, the lobes well defined by shagreened depressions, the disks of the lobes posteriorly shining; scutellum finely shagreened with two foveæ at base; hind femora with a brownish-black stripe above, the tibiæ and tarsi dusky behind; abdomen black, shining. Wings hyaline, the nervures brown, the second cubital cell with four irregular fuscous marks, the first near the base represented by a long streak, another parallel with the first just back of it is twisted, between it and the radius is a small, almost triangular spot, while back of this is another slightly curved, longitudinal streak; there are also some faint fuscous marks in the discoidal cell.

Type. — No. 7142, U. S. National Museum.

Sapporo. Described from a single specimen mounted on cardboard with its gall, found by Dr. Matsumura on *Quercus serrata*.

Dryophanta brunneipes, new species.

Female. — Length, 2 mm. Black and shining, the head on vertex and the disk of the mesonotum finely alutaceous, the scutellum rugulose; the antennæ are 14-jointed, black or brown-black, the extreme base and apex of the third joint yellowish; legs dark brown, the coxæ black, all knees, extreme tips of tibiæ, and the tarsi, except the last joint, honey-yellow; wings long, hyaline, the nervures dark brown.

Type. —No. 7310, U. S. National Museum.

Hakone. Described from two specimens collected by Mr. A. Koebele.

Dryophanta nawai, new species.

Female. — Length, 2.8 mm. Black and shining, the head on vertex and the pronotum, shagreen or wrinkled, the disk of the mesonotum smooth and highly polished, the scutellum and metathorax rugulose, opaque; the 14-jointed antennæ, except toward tips and the legs, including the coxæ, are brownish-yellow or honey-yellow, the tips of the antennæ more or less dusky; wings hyaline, the veins brown.

Type. — No. 7311, U. S. National Museum.

Gifu. Described from three specimens, labelled No. 41, received from Mr. Y. Nawa.

Dryophanta hakonensis, new species.

Female. — Length, 2–2.2 mm. Black and shining, the pronotum laterally more or less shagreened, the scutellum rugulose, opaque; antennæ 14-jointed, black or brown-black, except the apex of the pedicel, and an annulus at apex of the first joint of the flagellum which are yellowish; legs honey-yellow, the front and middle coxæ basally and the hind femora tinged with brown, the hind coxæ black; wings hyaline, the veins brown.

Type. — No. 7312, U. S. National Museum.

Hakone. Described from five specimens received from Mr. A. Koebele.

Dryophanta mitsukurii, new species.

Female. — Length, 1.5–1.6 mm. Polished, shining, the head, the antennæ, except the apical 5 or 6 joints, and the legs are all brownish-yellow; the abdomen is black; while the eyes, the 5 or 6 apical joints of the antennæ, a stripe down the middle mesothoracic lobe, and the nervures of the front wings are brown.

Type. — No. 7313, U. S. National Museum.

Atami. Described from seven specimens collected by Mr. A. Koebele. The species is named in honor of Dr. Mitsukuri, of the Imperial University of Tokyo.

Genus ANDRICUS Hartig.

Andricus japonicus, new species.

Female. — Length, 5 mm. Black and shining, the head and thorax above feebly punctate, the latter above well clothed with a sericeous pubescence, the scutellum finely rugulosely punctate; antennæ and legs black, the tarsi with a rufo-piceous tinge; wings hyaline, the veins brown, the basal abscissa of the radius angulated.

Type. — No. 7314, U. S. National Museum.

Hakone. Described from a single specimen received from Mr. A. Koebele.

Genus CALLIRHYTIS Förster.

Callirhytis hakonensis, new species.

Female. — Length, 4 mm. Black, finely punctate, and clothed with a sericeous whitish pubescence, the scutellum finely rugulose; antennæ brown-black; legs dark-reddish, with the hind tibiæ and a spot at base of hind coxæ fuscous; wings hyaline, the veins brown, the first abscissa of the radius acutely angulated.

Type. — No. 7315, U. S. National Museum.

Hakone. Described from a single specimen received from Mr. A. Koebele.

Callirhytis tobiiro, new species.

Female. — Length, 3 mm. Head and thorax, except the occiput, the grooved lines on the thorax and the mesopleura which are black, brownish-yellow, sparsely punctate, pubescent, the scutellum rugulose; antennæ 13-jointed, brown-black, the third joint one half longer than the fourth, the others to the last gradually shortening, joints 6–12 only a little longer than thick; legs and abdomen, except a fuscous or blackish spot above at apex, reddish, the hind tibiæ subfuscous.

Type. — No. 7316, U. S. National Museum.

Hakone. Described from five specimens collected by Mr. A. Koebele.

Tribe II, RHODITINI.

Genus RHODITES Hartig.

The only species so far recorded from Japan is *R. Japonica* Walker, described in 1876.

Rhodites hakonensis, new species.

Female. — Length, 3 mm. Head and thorax, except the scutellum which is rugulose, black and shining; ocelli pale; antennæ long, filiform, dull black; legs flavo-testaceous, the two basal joints of hind tarsi fuscous; abdomen wholly red; wings hyaline, the nervures dark brown, the radial cell with a fuscous cloud at base and along the long second abscissa of the radius, also surrounding the large triangular areolet, but more faintly.

Type. — No. 714, U. S. National Museum.

Hakone. Described from a single specimen received from Mr. A. Koebele.

Superfamily VII, *CHALCIDOIDEA.*

Family LXI, TORYMIDÆ.

Subfamily II. TORYMINÆ.

Genus TORYMUS Dalman.

Torymus japonicus, new species.

Male. — Length, 1.5 mm. Æneous black, with brassy tingings, smooth except a slight shagreening of the mesonotum; flagellum black, the joints being a little wider than long; legs æneous black to the base of the tibiæ, the tibiæ and the tarsi pale yellowish. Wings hyaline, the veins yellowish.

Type. — No. 7144, U. S. National Museum.

Gifu. Described from a single specimen taken by Mr. Y. Nawa, in October, and mixed with No. 73.

Torymus sapporoensis, new species.

Female. — Length, 3 mm.; ovipositor 2 mm. Metallic gold-green, the scutellum blue-green, with purplish reflections, the head below the antennæ and the abdomen

on the dorsum bluish, but bright green and cyaneous at the sides and beneath; legs, except the middle and hind coxæ, light brownish-yellow, the tarsi, except the last joint, yellowish-white, the last joint fuscous; pedicel æneous; flagellum dull, brown-black, pubescent; wings clear hyaline, the veins pale yellowish. The head and thorax are shagreened, the large hind coxæ reticulated on the basal two thirds, smooth or nearly at the apical third; the abdominal segments at the sides are delicately shagreened.

Type. — No. 7145, U. S. National Museum.

Sapporo. Described from a single female received from Dr. Matsumura.

Torymus gifuensis, new species.

Female. — Length, 2 mm.; ovipositor about twice the length of the abdomen. Metallic bronze-green, the axillæ, the scutellum, the metathorax, and the hind coxæ cupreous; head and thorax shagreened; abdomen smooth, æneous black, with a bluish tinge in certain lights; scape and pedicel æneous black, the flagellum dull, brown-black, pubescent; legs metallic greenish, the tibiæ and tarsi, except terminal joints, pale yellowish, the hind coxæ bright cupreous. Wings hyaline, the veins brown.

Male. — Length 1.8–2 mm. Head and thorax bright metallic-green, shagreened, the abdomen smooth, æneous-black; antennæ black, the joints of the flat gellum hardly longer than wide; legs with the apices of all femora, the tibiæ and tarsi, yellow, the hind tibiæ more or less brownish from the middle to near apex; otherwise similar to female.

Type. — No. 7146, U. S. National Museum.

Gifu. Described from one male and two female specimens, labelled No. 74, received from Mr. Y. Nawa.

Subfamily III, MONODONTOMERINÆ.

Genus MONODONTOMERUS Westwood.

Monodontomerus japonicus, new species.

Female. — Length, 3 mm.; ovipositor less than half the length of the abdomen. Blue, the head and thorax, sparsely, feebly punctate, the scrobes metallic green, shining; ocelli red; scape, except at apex, reddish-brown, the pedicel æneous black, the flagellum dull black, the joints, after the first, a little wider than long; front and middle tibiæ and all tarsi, honey-yellow, the middle tibiæ more or less fuscous above, the hind tibiæ wholly fuscous or black; rest of legs blue. Wings hyaline, the veins brown-black, the stigmal vein ending in a long uncus which is obliquely directed towards the postmarginal vein and forms nearly a closed marginal cell; the stigmal vein is enclosed by a fuscous cloud. Abdomen polished, shining, with the segments 4 and beyond, clothed with a whitish pubescence.

Male. — Length, 2.2 mm. Agrees well with the female in color except that the scape is æneous above and the head on the vertex is metallic green.

Type. — No. 7147, U. S. National Museum.

Nikko. Taken by Mr. A. Koebele.

Subfamily IV, PODAGRIONINÆ.

Genus PODAGRION Spinola.

Podagrion quinquedentatus, new species.

Male. — Length, 3.4 mm. Dark bluish-green, the front of the head metallic-green; scape of antennæ and legs, except the coxæ and the hind femora, which are of a dark metallic-bluish tinge, brownish-yellow, the hind tibiæ brown or dark fuscous; the swollen hind femora are armed with *five* teeth beneath; flagellum brown-black. Wings hyaline, the veins brown. Abdomen æneous black, but yellow beneath for half its length at base.

Type. — No. 7148, U. S. National Museum.

Hong-Kong, China. This species was taken by Mr. A. Koebele; it is evidently allied to *P. sinensis* Walker.

(*To be continued.*)

THE PHILANTHIDÆ OF NEW MEXICO.—I.

BY H. L. VIERECK, AND T. D. A. COCKERELL,

NEW HAVEN, CONN. COLORADO SPRINGS, COL.

Genus EUCERCERIS Cresson, 1865.

TABLE OF SPECIES (alternative).

1. Legs yellow and black; base of metathorax striate 2.
 Legs red, reddish or with some yellow 3.
2. Mesothorax very sparsely punctured **striareata.**
 Metathorax quite closely punctured **chapmanæ.**
3. Head black with a yellow, rarely red, spot above or just back of each eye... 4.
 Head with much red, or at least a red or brownish patch on cheeks 7.
4. Enclosure of metathorax punctured; scutellum entirely black **montana.**
 Enclosure of metathorax transversely striate; scutellum with light markings.. 5.
5. Abdomen without red 6.
 Second segment of abdomen at least red **tricolor.**
6. Scutellum and enclosure without yellow spots **simulatrix.**
 Scutellum and enclosure with yellow spots **fulvipes.**
7. Sides of mesothorax sparsely punctured on a shining ground 8.
 Sides of mesothorax closely punctured, the punctures more or less confluent.. 9.
8. Top of head red except between the ocelli or occiput partly black; clypeus of ♀ with a prominent projection **unicornis.**
 Top of the head black with red intruding laterally **rubripes.**
9. Larger; head largely, cheeks and vertex red; clypeus of ♀ with a prominent median projection **fulviceps.**
 Smaller 10.
10. Region on each side of ocelli usually black; a prominent process on each side of clypeus in ♀. **canaliculata.**

Cheeks and vertex at least partly brown; clypeus with a truncate, not very prominent process.....zonata.

TABLE OF SPECIES (alternative).

1. Second submarginal cell petiolate..... 7.
Second submarginal cell not petiolate..... 2.
2. Metathorax largely black..... 3.
Metathorax with very little or no black..... 6.
3. Occipital region black and with a yellow spot..... 4.
Occipital region black and red, no yellow; bands on abdomen pure yellow. **rubripes.**
4. A small shining space at apex of triangular enclosure of metathorax; scutellum and postscutellum maculated..... 5.
No small shining space at apex of triangular enclosure; scutellum immaculate, postscutellum yellow.....**chapmanæ.**
5. Enclosure transversely striated.....**simulatrix.**
Posterior border of enclosure smooth, not striated.....**fulvipes.**
6. Female with a prominent process each side of clypeus, in male simply convex; largely yellow, decorated with red.....**canaliculatus.**
7. Head partly or entirely red or brown..... 8.
Head black and yellow or cream color..... 10.
8. Female clypeus with a prominent acute production..... 9.
Clypeal production not prominent, truncate.....**zonata.**
9. Pygidial area long and narrow, more than twice as long as broad..... **unicornis.**
Pygidial area hardly twice as long as broad; metathorax red, yellow and black. **fulviceps.**
10. Light marks pale primrose color.....**tricolor.**
Light marks bright yellow..... 11.
11. Enclosure on metathorax inconspicuous, punctate.....**montana.**
Enclosure on metathorax conspicuous, striate.....**striareata.**

Eucerceris striareata, new species.

♀. Length 15 mm., black and yellow. Head large; eyes diverging below; a longitudinal ridge between antennæ; mandibles long, with a prominent tooth on inner side; clypeus not produced into a spine; lower margin of clypeus with a pair of short black denticles on each side opposite the mandibular tooth, which appears to fit between them; face closely punctured, becoming striate-punctate on the front; head black, with the clypeus, base of mandibles, stripe from very near anterior ocellus to clypeus (widening below to form a triangular supraclypeal mark), very broad lateral face marks (ending very bluntly on front, there diverging from the orbits), and broad band behind eyes, all deep lemon-yellow; antennæ black, with the first three joints of the flagellum ferruginous, and the fourth partly so; thorax black, with the upper border of prothorax broadly, a round spot with a linear upward extension below tegulæ, a large spot on each anterior corner of scutellum, postscutellum, and a large mark on each side of metathorax, all bright yellow; mesothorax shining and sparsely punctured, the parapsidal grooves very distinct, a small area on anterior margin on each side of middle covered with minute punctures; scutellum very sparsely punctured, except on its posterior margin, where the punctures are closer; enclosure of

metathorax very distinct, with a median groove, and strong, regular, oblique striæ; sides of metathorax striate-punctate; tegulæ dark reddish, with a large yellow spot in front; wings clouded on costa and apex as usual, the nervures ferruginous; second submarginal cell petiolate above; second recurrent nervure practically meeting second transverso-cubital; coxæ black with a yellow spot in front; femora yellow with a large black area, pointed apical, behind, this on the hind femora nearly enclosing a yellow mark; tibiæ yellow with ferruginous spines; tarsi with the basal joint more or less yellow, the others ferruginous; abdomen yellow marked with black, the yellow parts very sparsely punctured, except towards the bases of the segments, the black parts roughened; first segment black with a broad yellow band, deeply notched anteriorly and posteriorly in the middle; second broadly black at base and with a transverse median black mark; third to fifth narrowly black at base, the third and fourth with a long transverse black mark; sixth black, except the hollowed areas on each side of the pygidial plate, which are yellow; pygidial plate narrow; venter yellow, banded with black.

One specimen: White Oaks, New Mexico, collected by Miss Bertha Chapman.

Eucerceris chapmanæ, new species.

♂. Length 13½ mm., black and yellow. Similar to *E. striareatus*, but differing as follows (part of the difference being sexual): Eyes much larger, face much narrower; clypeus without any black denticles on margin; scape shorter and thicker and yellow in front; flagellum black, the second to fourth joints reddened beneath; cheeks with no yellow band, but only a small spot on upper part; metathorax quite closely punctured all over; scutellum entirely black, yellow marks on metathorax much smaller; second submarginal cell joining marginal; second recurrent nervure joining third submarginal cell about as far from its base as first recurrent nervure is from base of second submarginal; black area on hind femora not enclosing a yellow mark; hind tibiæ with a black apical patch on inner side; abdomen black with six bright yellow bands, that on second segment with an anterior process on each side directed anteromesad; claspers very large, the apical half strongly hairy above; ventral surface of abdomen yellow, as also is the under surface of the thorax. (In *E. striareatus* the sternites are entirely black).

One specimen, collected by Miss Bertha Chapman, after whom it is named. It is believed to be from White Oaks, New Mexico, but there is just a possibility that it came from the Yosemite, California. This insect looks like the male of *E. striareatus*, but the sculpture of the mesothorax, the pattern of the abdomen and color of the sternal parts are entirely different. The top of the head and the anterior part of the thorax are quite hairy, the hair being of a sordid whitish.

Eucerceris montana Cresson.

Twenty-two specimens; twenty from Highrolls, Sacramento Mts., N. M., May 29 to June 3, 1902 (Viereck); two from Amogordo, N. M., May 13, 1902 (Viereck). Also found in the Mesilla Valley.

The second submarginal cell is petiolate (above) in the male.

Eucerceris simulatrix, new species.

♂. Length 10½ mm.; black and pale yellow, with red legs. Similar in appearance and pattern to *E. montana*, but smaller, with a considerably smaller head, the second submarginal cell not petiolate above, but broadly joined to the marginal, and the basal enclosure of metathorax strongly transversely striate, except at the tip; where it is smooth and shining. The mandibles are ordinary, not massive as in *montana*. Eyes slightly diverging below; clypeus with three little apical teeth, vertex and occiput black, very densely and coarsely punctured; this black sends downwards a pair of stripes passing through the antennal sockets and ending very narrowly at the clypeus, but otherwise the face is light yellow; scape with a pale yellowish stripe in front; first three joints of flagellum ferruginous; basal two thirds of mandibles yellow; a round yellow spot behind the upper part of each eye; mesothorax posteriorly with widely-separated punctures on a shining ground, anteriorly closely punctured; upper border of prothorax extending to tubercles, two marks (one above the other) on pleura, anterior border of scutellum narrowly interrupted in the middle, postscutellum, and a large mark on each side of metathorax, all pale yellow; metathorax strongly punctured, except the enclosure, which is strongly transversely striate, with a smooth apical area; tegulæ black basally, dark red outwardly, and pale yellow in front; stigma bright ferruginous, nervures fuscous; sternites along the middle line, and coxæ in front, pale yellow; first four femora largely yellow beneath, and their tibiæ yellow on outer side, the legs otherwise red, with a black shade on the middle femora above, and a black stripe on the hind tibiæ behind, and the coxæ are black behind; abdomen with the segments strongly constricted, strongly but not very densely punctured, black with six light yellow bands; on the venter there is some red, especially on the second segment.

One specimen; Las Vegas, N. M., June 26, 1902 (Viereck).

Eucerceris tricolor (Cockerell).

Described as a variety of *E. vittatifrons*, but its characters persist in a considerable series, and it is probably a valid species. Sometimes the third abdominal segment is red as well as the second. Las Cruces, N. M., Sept. 5, two (C. H. T. Townsend); Las Cruces, Oct. 5, 1895, at flowers of *Gutierrezia glomerella* Greene, one (Cockerell); Highrolls, Sacramento Mts., N. M., May 30 to June 10, nine (Viereck); Alamogordo, N. M., May 13, 1902, three (Viereck).

Eucerceris unicornis Patton.

The amount of red on the abdomen is quite variable.

Las Cruces, N. M., one (C. H. T. Townsend); Las Vegas, N. M., June 26, 1902 (Viereck).

Also Colorado (with number 1,601) and Montana (Cresson collection).

Eucerceris fulviceps Cresson, var. rhodops, new variety.

Scutellum entirely black (red in the typical form, which is also from New Mexico).

♀. Length about 14 mm.; head red, face yellow; thorax black, marked with yellow; abdomen lemon yellow above, sutures red and black, apical segment black; venter with basal two thirds red, apical third black; legs red; wings dark fuliginous. Mandibles with a very large tooth within near base; clypeus excavated and extremely narrow, leaving a large space between clypeus and mandibles; middle of clypeus with a long marginal tooth directed anteriorly; antennæ with the first four joints red, the rest black; base of metathorax strongly transversely grooved, with a longitudinal median groove; sides of the enclosure with two long yellow marks converging caudad; pygidium broad, rugose, rounded at end. Eyes in life deep red

A most beautiful and peculiar species. One, Pecos, N. M., at flowers of *Eriogonum*, Aug. 19, 1903 (Wilmatte P. Cockerell).

Eucerceris rubripes, Cresson.

Highrolls, N. M., June 3, 1902 (Viereck); Santa Fé, N. M., August (Cockerell, 3,984); Glorieta, N. M., Aug. 23, 1903 (Cockerell). The eyes of the male in life are green suffused with red.

Eucerceris canaliculata (Say).

Las Cruces, N. M. (C. H. T. Townsend); Alamogordo, N. M., eleven, May 13, 1902 (Viereck).

The two following occur in New Mexico, but are not contained in the collection before us:

Eucerceris zonatus (Say).

Mesilla Valley.

Eucerceris fulvipes Cresson.

Las Vegas.

Class I, HEXAPODA.

Order II, COLEOPTERA.

CATERPILLARS ATTACKED BY HISTERS.

By Wm. T. Davis,

Staten Island, N. Y.

The following observations on caterpillars being attacked by North American species of *Hister* may be of interest from the fact that the manuals of entomology generally give the student the impression that the Histeridæ are scavengers only. Some make the statement without

reserve, others state that Histers are found about decaying substances, under bark and in ants' nests without saying what they feed on. In the Cambridge Natural History Dr. Sharp writes: "Formerly it was supposed that the insects were nourished on the decaying substances, but it is now believed, with good reason, that they are eminently predaceous in both larval and imaginal instars, and devour the larvæ of Diptera, etc." Ganglbauer fills in this "etc.," as far as caterpillars are concerned, by saying that the European *Hister pustulosus* attacks the caterpillars of *Agrotis*.

On May 29, 1903, when several of the members of the New York Entomological Society were at Fort Montgomery, on the Hudson, we walked along a woodpath at the base of Bear Mountain. There was but a subdued light, as the woods were thick and the morning cloudy. At the base of a large tree I discovered a caterpillar (an immature noctuid larva) about an inch long that had been seized on its back near its anal extremity by a Hister, which has since been identified as *H. interruptus* Beauv. The beetle's jaws were firmly fastened into the caterpillar, which was making off as fast as possible, but now and then turning on the Hister and struggling hard to free itself. We watched these struggles for some time, and then bottled the insects for future identification.

This is the only instance in which I have observed the predaceous habit of *Hister*, but I have found the following American records bearing on the subject.

In *Entomologica Americana* for August, 1889, Mr. Charles Liebeck writes of a collecting trip at Westville, N. J. He says: "On the same day I noticed an unusual carnivorous inclination on the part of a single *Hister biplagiatus*. Its victim was a smooth caterpillar about one and one quarter inch long, which it had seized on top of the second segment, burying its head beneath the skin, after the manner of a tick. For fully fifteen minutes I watched them, during which time the unlucky caterpillar's frantic struggles failed to dislodge its assailant, who never once relaxed the grip of its jaws. By this time the caterpillar was covered with the juice oozing from its wound, and having satisfied myself of the intention of the *Hister*, I consigned them both to the alcohol bottle for future reference. My previous knowledge of the habits of this *Hister* has been confined to the droppings around pig-pens, where it may possibly feed upon the numerous larvæ found in such places."

In *Insect Life* for October, 1891, Mr. D. W. Coquillett, writing from Los Angeles, Cal., under date of June 8, 1891, says: "All of the authors which I have been able to consult upon the habits of Histeridæ (Packard, Harris, Le Baron, and Horn) state that these insects live in excrements, in decayed animal or vegetable matter, beneath the bark of trees, in ants' nests, and so on, but none of them even so much as hint at their predaceous habits. A few weeks ago I saw an adult *Hister sexstriatus* Lec. attack a nearly full grown larva of *Agrotis ypsilon* Rott., seizing it with its jaws as a cat would a rat and holding on despite the attempts of the cut-worm to escape. This was late in the afternoon of a cloudy day, and as my time was limited, I placed both specimens in my cyanide bottle, where the unequal combat soon terminated."

After an examination of the short-legged Histers one is inclined to the opinion that they stand far greater chance of catching fly larvæ in manure, for instance, than the more active caterpillars of Lepidoptera, and perhaps this accounts for the few observations that have been recorded on the subject.

In conclusion I wish to thank both Mr. Schaeffer and Mr. Leng for passing upon my *Hister interruptus*, and Dr. Dyar for examining the caterpillar.

Class I, HEXAPODA.

Order IV, DIPTERA.

THE LIFE HISTORY OF CULEX VARIPALPUS COQUILLETT.

By Harrison G. Dyar, A.M., Ph.D.,

Washington, D. C.

(Plate III.)

As previously reported (Proc. Ent. Soc. Wash., VI, 39, 1904), I found this mosquito in eastern British Columbia. It was described from Arizona, so the range seems to be up the Western slope of the Rocky Mountain chain. It is a single brooded species, most nearly allied to *C. atropalpus* Coq. The eggs are laid scattered, singly, adhering to objects at the side of or under the water, but not definitely

attached as are those of *C. atropalpus*. They hibernate either dry or wet according to the condition of the environment. Immediately on the thawing of the ice in spring many of the eggs hatch, but others hatch later and irregularly so, some not developing for a month or more after the first ones. Consequently larvæ of various sizes occur in the same position till late in the season. The growth of the larvæ is slow. Their long anal processes supplied with tracheæ enable them to remain long under the water and, when disturbed, they will wriggle at the bottom of the dish with a continuous, rather slow, serpentine motion for longer than one has the patience to watch them. I have occasionally observed them in the breathing position. The food seems to consist of various decaying matters. Of insect remains they seem especially fond. A dead fly was introduced into the jar and, after it had become well moulded, the larvæ could be seen in a dense cluster about it, apparently biting and tugging and struggling to get at the object. I do not know exactly what sort of natural breeding places the larvæ frequent. My colony came from a tin vessel in an abandoned hut. From these I bred adults which deposited eggs that passed the winter and hatched the following spring as I have described.

The egg (Plate III, Fig. 1) is fusiform, one end more tapered than the other, one side flattened. It is very small, being .5 mm. long and .2 mm. wide. Deep black in color with peculiar sculpturing, reticulate in elongate ellipses like craters, all spicular granular shagreened.

In the first stage (Plate III, Fig. 2) the larvæ are small, colorless whitish, the harder parts scarcely at all infuscated. The head is rounded and rather long, flattened, normal, the antennæ moderate, uniform with a slight hair at the middle. Eyes small and weak, but transverse. The body has the usual flattened globose thorax and submoniliform abdominal segments. The prothoracic hairs are shorter than the others. Air tube about three times as long as wide, very slightly inflated, weakly infuscated at the tip; a weak pecten followed by a hair. Lateral comb of the eighth segment of a few spines (Plate III, Fig. 3) in a single row, weak and illy defined. Anal segment without perceptible plate, a dorsal posterior tuft and single hair on each side but no ventral brush. Anal processes not large but cylindrical, rounded and tracheate.

The second, third and fourth stages are essentially alike. The ventral brush is acquired (Plate III, Fig. 4), but it does not arise from

a barred area as usual and there is no perceptible dorsal plate. The head is slightly elongated, very pale brown, the antennæ rather short, weak, the small tuft in the middle (Plate III, Fig. 5). The prothoracic hairs are much reduced. Air tube moderate, about two and a half times as long as wide, weakly infuscated, the pecten teeth (Plate III, Fig. 6) followed by a single hair tuft at about the middle. Lateral comb of rather few spines (Plate III, Fig. 8) in an irregular double row, the single spines somewhat sole-shaped and fringed to the apex (Plate III, Fig. 9). Anal processes very long, cylindrical, sack-like, rounded at the end, rather opaquely whitish, with numerous elliptical spots in which the branches of the tracheæ seem to terminate. Dorsal tuft and ventral brush much alike in appearance; also a single lateral hair.

The pupa has the usual appearance.

EXPLANATION OF PLATE III.

Fig. 1. Egg of *Culex varipalpus* Coq.
Fig. 2. Stage I of the same.
Fig. 3. Single tooth of the lateral comb of the eighth segment, stage I.
Fig. 4. Diagram of the anal segment, stage II, showing dorsal and ventral tufts.
Fig. 5. Stage IV.
Fig. 6. Single tooth of the pecten of the air tube.
Fig. 7. Labial plate.
Fig. 8. Lateral comb of the eighth segment.
Fig. 9. Single tooth of the lateral comb.

Class I, HEXAPODA.

Order V, LEPIDOPTERA.

SOUND PRODUCED BY A JAPANESE SATURNIAN CATERPILLAR.

By A. S. PACKARD, M.D.,

PROVIDENCE, R. I.

While rearing from the eggs a number of the larva of the Japanese Saturnian moth, *Rhodia fugax*, Mr. Joutel observed, as he kindly informs me that the larva in its last stage "makes a squeaking noise by

moving its head up and down on the prothorax." The two larvæ which I had, did not reach the last stage of development, so that I had no opportunity to repeat this observation.

In his second annual report on the noxious, etc., insects of Missouri, the late C. V. Riley states that the caterpillar of *Thyreus abbotii* " does not assume the common sphinx attitude of holding up the head, but rests stretched at full length, though if disturbed it will throw its head from side to side, thereby producing a crepitating noise " (p. 79).

So far as I am aware, this is the only other instance known of a lepidopterous larva producing by friction or in any other way an audible sound.

It is probable, however, that there are similar cases on record and I would be much obliged for any information regarding them.

NOTE BY THE EDITOR.

The larva of *Cressonia juglandis* is well known to produce a squeaking noise when disturbed, apparently by motions of the head against the prothorax. *Platypteryx arcuata* produces a rasping sound by scraping certain stiff setæ on the surface of the leaf and some Tineids make a rustling noise by motions within their dried leaf mines; but these latter cases are perhaps not of the class of which Dr. Packard desires to learn.

REMARKS ON THE CATALOGUE OF THE NOCTUIDÆ IN THE COLLECTION OF THE BRITISH MUSEUM.

BY JOHN B. SMITH, SC.D.,

NEW BRUNSWICK, N. J.

(PLATE IV.)

This is Volume IV of the Phalænæ and, like the preceding volumes, is prepared by Sir George F. Hampson. After defining the Noctuidæ the author divides them into 15 subfamilies of unequal value and extent. As this is the first really well based attempt to make a subfamily division the table is reproduced, modified in form only:

1. Maxillary palpi absent 2
 Maxillary palpi present 15

2. Hind wing with vein 5 obsolescent, from or just below middle of discocellulars 3
Hind wing with vein 5 well developed 6
3. Mid and hind tibiæ, or hind tibiæ only spined AGROTINÆ.
Mid and hind tibiæ not spined 4
4. Eyes hairy HADENINÆ.
Eyes not hairy 5
5. Eyes with long overhanging cilia CUCULLIANÆ.
Eyes not ciliated ACRONYCTINÆ.
6 Hind wing with vein 5 more or less approximated to 4 at base 7
Hind wing with vein 5 parallel to 4 14
7. Frenelum of female simple 8
Frenelum of female multiple 9
8. Abdomen with lateral anal pencils of hair EUTELIANÆ.
Abdomen without anal pencils of hair; forewing with tufts of raised scales in cell STICTOPTERINÆ.
9. Retinaculum of male bar-shaped 10
Retinaculum of male not bar-shaped 11
10. Forewings with tufts of raised scales in cell SARROTHRIPINÆ.
Forewings without tufts of raised scales in cell ACONTIANÆ.
11. Mid tibiæ spined CATOCALINÆ.
Mid tibiæ not spined 12
12. Eyes hairy MOMINÆ.
Eyes with long overhanging ciliæ PLUSIANÆ.
Eyes neither hairy nor ciliated 13
13. Hind wing with vein 5 from close to lower angle of cell, strong NOCTUINÆ.
Hind wing with vein 5 from well above angle of cell, rather weak .. ERASTRIANÆ.
14. Hind wing with vein 5 parallel to 4 HYPENINÆ.
15. Maxillary palpi present HYBLÆINÆ.

The first point that attracts attention in this table is the departure from the uniform subfamily termination so generally used in American works. That really amounts to a matter of practice only and the substitution of *iinæ* for *ianæ* is easily made by one who prefers it.

Nothing is more variable than the force with which characters appeal to students in the same group and it is quite remarkable how one structure or set of structures may dominate an arrangement to the subordination of others which seem of greater value to another. I am of course quite as one-sided as others and will not pretend to say that Mr. Hampson has given undue importance to any one character. Yet I would not go so far in some directions as he does and I would use other characters.

The Hyblæinæ might properly be raised to family rank and the Euteliinæ and Stictopterinæ with the simple frenelum in the female are certainly more sharply separated off than are some of the others.

The basis of the chief division is essentially the old Trifid and Quadrifid classification and in the main it is a good one; but as I have pointed out in the revision of our species of *Acontia*, that genus contains perfect trifids and perfect quadrifids. I am also unable to appreciate the character given for the Hypeninæ which I believe occurs equally in some of the Noctuinæ.

And this brings us to one of the most unfortunate features of the work from the standpoint of those who agree with the canons of nomenclature which have been adopted by the American Ornithologist's Union; *i. e.*, the subfamily names based on genera used in a sense different from the one heretofore accepted. The term Agrotinæ will pass, because *Agrotis* in the old broad sense is the leading genus, but to use Hadeninæ for a distinctively hairy-eyed series is misleading to those of us who use *Hadena* as Lederer and Guenée used it and as it is yet used in Staudinger and Rebel's Catalogue. The method of determining a generic type by selecting the first species placed under it by the author no matter what the remainder of the group might be, does not strike me as logical and it ignores the work of a series of students who have pretty generally assumed the privilege of subdividing genera as seemed most natural; retaining the original generic name for a series of the species placed under it by its author.

The term *Noctua* applied to an Erebiid genus is disconcerting to one who has been in the habit of associating it with a typical "owlet" moth.

As to the others, there is no reasonable objection to be made unless it be that *Cucullia* is hardly a sufficiently generalized form to serve as typical of the species with lashed or ciliated eyes.

The first point to attract attention in the division of the Agrotinæ is the close association that it brings about between the Agrotids and the Heliothids, and next the separation that it makes from those forms with non-spinose tibiæ which we have been in the habit of placing with them. I have not quite convinced myself, as yet, that *Heliaca* and *Melicleptria* are really members of distinct subfamilies and there are others that I am not inclined to remove from their present associations.

The table of genera on pages 7–10 is a work of art and shows, first, that secondary sexual characters like antennal structure are not recognized as of generic value at all and, second, that the tibial arma-

ture is considered as of more importance than the eye vestiture or fringing.

Mr. Hampson speaks from a much broader knowledge than my own, for the collections in his care come from all parts of the world — therefore his opinions should carry weight accordingly; for myself the study of our own fauna has led me to conclude that all the hairy-eyed genera are descendants of one common stock and that in the Noctuidæ hairy eyes were developed at one point only. The spinose armature of the tibia is so variable and so easily modified that I cannot give it so great a value as the hairy or naked eyes.

As to divisions based on characters found in one sex only, I find them convenient in the breaking up of unwieldy genera, and their use in some other orders is almost universal. As genera are admittedly opinionative — some species being apparently in the same boat — no fault can be found.

The descriptive work begins with what we have considered Heliothid genera, and, regarding only the American forms, *Heliolonche* Grt., heads the list. *Heliophana* Grt., and *Heliosea* Grt., follow as used in our lists; *Heliothis* Ochs., includes most of the species we call *Melicleptria*. *Melaporphyria* is quite properly restricted to *immortua*, and *Dysocnemis* is used for the other species of my list. *D. borealis* from St. Martin's Falls, Hudson's Bay, is described as new. I have had specimens from Calgary and British Columbia set aside for some time, but when first received, I mistook them for *belladonna*.

Pyrocleptria (new genus) *californica* Hamps. is another addition to our fauna from Walsingham's Californian collection. *Pseudotamila* Sm., gets a Chinese addition. *Chloridea* Westw., is made to include *Aspila* Gn., *Heliocheilus* Grt., and *Heliothis* Hbn. I am not at all sure that this is a good combination and regret *Heliothis armiger* could not be retained. The suggestion made in my catalogue that *albidentina* Wlk., and *paradoxa* Grt., are good species is sustained, and Butler's reference of *inflata* Wallgr., is denied, though the latter is nevertheless made a synonym of another of Wallengren's species. Mr. Hampson denies the right of an author to correct a specific name, therefore writes *C. phloxiphaga* G. & R., instead of *phlogophaga* as Mr. Grote corrected it later. *Oxylos* Grt., is retained for *citronellus* G. & R., and *Schinia simplex* Sm., is now the type of *Chlorocleptria* Hamps. *Dasyspondæa* Sm., remains undisturbed and so does *Rhodophora* Gn., save that *citronellus* is removed as above noted. *Thyreion*

Sm., gets *Schinia ligeæ* Sm., as an added species though I am not quite ready to subscribe to the correctness of this reference. *Rhododipsa* Grt., remains unchanged. *Schinia* and *Lygranthœcia* are about as in my recent list; but the addition of *Pippona* is a surprise. The type is in the British Museum and the reference should be correct; but the peculiarities of venation, wing-form and clypeal characters pointed out by me should hold the genus unless, indeed, my specimen was an abnormal one. To *Schinia* comes *Bessula luxa* which I suspected before I saw the type; but have regarded as a good generic form ever since. *Eupanychis* Grt., is recognized for *spinosæ* Grt., and *crenilinea* Sm., is added to it. *Melicleptria* Hbn., contains only one American species, *M. scutosa*, and that is American only because Mr. Grote redescribed it as *nuchalis*. *Timora* Wlk., contains forty species with *Rhodosea julia* as the only American member and as it also forms a section by itself, it will not be doing serious violence to classification if it be given generic recognition as separate from its African and Asiatic allies. *Copablepharon* Harv., contains only our own species and the specific names in this genus, only one of which is written as originally described, attract attention to the fact that terminations have been ruthlessly altered in all cases where necessary to a grammatical agreement with the generic name. The tendency with us has been rather in the direction of letting the name stand as originally written whether the ending was right or wrong. *Actinotia* Hbn., contains no American species and our *A. ramosula* and *A. stewarti* are temporarily without a home — the specific names occurring nowhere in the index — or elsewhere so far as I have been able to find. With this genus the real Noctuid series begins, the Heliothid type being fairly ended by *Copablepharon*. *Agrotiphila* Grt., is distinctively Agrotid in type but we get, in addition to the species so placed by me, *Anarta quieta* Hbn., with synonyms *A. schœnherri* Zett., *constricta* Wlk., and *rigida* Wlk. If this is correct it means that some of the identifications current in our collections are erroneous. *Orosagrotis* is a new genus based on *Agrotiphila rigida* Sm., with *incognita* and two species from Kashmir to keep it in countenance; but I must confess to a distinct doubt as to the validity of this genus. My great comfort after reading and comparing the descriptions and specimens was that if I went to extremes in some directions, I was no worse than my neighbors who walked in other paths. *Porosagrotis* Sm., is recognized on a basis somewhat different from that originally suggested by

me. *Carneades siccata* is added, perhaps correctly, while as to *Feltia longidens* I wish to register a doubt. *Euxoa* Hbn., is the banner genus of the series, containing no less than 332 species. Nineteen names appear in the generic synonymy, including *Pleonectopoda* Grt., *Carneades* Grt., *Chorizagrotis* Sm., and *Rhizagrotis* Sm., which are based on North American species It is a question of policy, perhaps, whether so unwieldy a genus should not be divided into subgenera at least, to make recognition of group characters easier.

There has been some change in the synonymy of our species, based upon a closer examination of some of the Walker and Grote types in the British Museum than I was able to make; but in some instances I think the error is Hampson's unless, indeed, the actual types were not before me when I made my notes. At that time the noctuids were yet in large part unarranged and the Grote collection had not been incorporated. There are also a few specimens in the latter collection erroneously named and not the types — which may have added to the confusion. As soon as the work on the more typical noctuids is completed I will try to make another direct comparison and with the assistance of Mr. Hampson, the synonymy of the American species may then be finally settled. In 1900 when I looked over the collection I failed to note any obvious errors, and certainly no such gross blunders as would appear in the mixture of names under *messoria*, *tessellata* and *insulsa* in my catalogue.

Agrotis dolis Grt., figures as a synonym of *E. birivia* Hbn., and the locality Colorado is said to be incorrect. This is right, I believe. Two specimens without locality labels, were sent by the late Dr. George D. Hulst to Mr. Grote, as part of a lot of Colorado material. Dr. Hulst stated to me that he found them in a box of specimens purchased from Mr. Morrison and supposed them to be part of the collection made that year. As Dr. Hulst at that time had a collection of European Noctuids and as no additional specimens of *dolis* have since appeared, it seems safe to conclude that an error was made and to omit the species from future lists.

My *Carneades incubita* is cited as a synonym of *Euxoa septentrionalis* Wlk., which I had referred as a synonym of *messoria*. This is quite likely correct, because it was not until 1900 that I recognized the distinctness of the forms theretofore lumped under *messoria*. Under *E. messoria*, *insulsa* Wlk., and *expulsa* Wlk., appear as synonyms and this I can scarcely believe correct. *Messoria* and *insulsa*

as I have them are so very different that it seems incredible that I could have confused them no matter how bad the specimens. *Agrotis cogitans* is made a synonym of *Euxoa choris* Harv., which I am not ready to believe is right. I have a good colored figure of type *choris* made a dozen years ago, and Hampson's figure is at least fair — *cogitans* is not like either. *Agrotis pleuritica* Grt., is cited as a synonym to *insignata* Wlk., and this again puzzles me, for as I remember them there was no resemblance between the two. *Euxoa decolor* Morr., obtains specific rank with *campestris* Grt., as a synonym, all the Walker names being referred elsewhere. *Euxoa tessellata* Harr., gets *perlentans* Wlk., *insignata* Wlk., *illata* Wlk., *subsignata* Wlk., and *declarata* Wlk., as synonyms. *E. verticalis* Grt., is made a good species — properly I think; but my *spectanda*, which appears as a synonym is also good and not at all like the species to which it is referred. *Euxoa auxiliaris* Grt., has *introferens* Grt., and *soror* Sm., as synonyms — incorrectly I am sure. *Soror* is certainly different and I believe that *introferens* is equally good. This whole series of species is very common and I have long suites in the collection. When the sexes are separated distinction is easy, for the females of the one resemble the males of the other more than they do their own mates. *Agrotis cloanthoides* Grt., is placed as a synonym to *Euxoa albalis* Grt., and so I believed them to be until recent good material makes it certain that they are really distinct. On the whole, where we have over 200 of the species of this genus in our fauna, there has been surprisingly little change.

Feltia Wlk., receives one of my species of *Porosagrotis* and the synonymy is not quite in accord with my list. *Subgothica* Haw., is made the same as *jaculifera* Gn. = *tricosa* Lint., and on this point I think the author is in error. Slingerland demonstrated the identity of Haworth's species very fairly, it seems to me. *F. ducens* Wlk., is used for the species we have been calling *subgothica*. *Agrotis* Ochs., is used for the species in my list; *opacifrons* is added to the third section and then come all the species separately listed by me as *Noctua*. *N. smithii* Snell., is not recognized as different from *baja* Fabr., yet there is certainly a difference in the tibial spinulation between the European and American examples. Just how far this may be a variable feature is not yet determined; but in view of the value assigned to it in generic separation, it seems odd that it should not be, in this case, considered as even of specific value. *N. hospitalis* Grt., is cited

as a synonym to *brunnea* Schiff., and perhaps correctly; the species is so rare that in all my experience I have seen less than half a dozen examples. *Eriensis* is made a synonym of *jucunda* instead of *phyllophora* which may be correct, though I am not ready to accept the reference until I can see the example again myself.

Our familiar *A. clandestina* Harris, will have to sink in favor of *unicolor* Wlk., which no doubt has priority. The dates are correctly given in my catalogue; but I hated to give up one of the Harris names and therefore compromised by stating the facts and failing to act up to them. Just why Dr. Dyar followed me in this lapse from strict synonymical integrity he must himself explain.

Agrotis unimacula Morr., replaces *A. haruspica* Grt., and thereby a very interesting question is raised. Staudinger described an *Agrotis unimacula* in 1859, and in his catalogue of 1871 refers it, questionably, as a variety of *plecta;* and so it yet stands in the edition of 1901. In 1874, Mr. Morrison also described an *Agrotis unimacula*, and Mr. Grote in 1875 pointed out this duplication, suggesting *haruspica* to replace it. Mr. Hampson now writes *unimacula* Stgr., a synonym of *plecta* and restores *unimacula* Morr. Has he a right to do this; his own opinion as to the status of Staudinger's species being the only thing that gives vitality to his action? Does not the same principle that "once a synonym, always a synonym" govern here as well? Personally I shall continue to write *haruspica* Grt., though not for exactly the same reasons that influenced me in writing *clandestina* Harris.

Metalepsis cornuta Grt., still stands alone; but in *Eucoptocnemis* a South American species is added and two species are recognized in our fauna: *fimbriaris* Gn., with *obvia* Wlk., as a synonym, and *tripars* Wlk., with *worthingtoni* Grt. as a synonym. The generic association is undoubtedly correct and the only point on which I am yet in doubt is, whether we really have two species; no two of my examples are alike!

Onychagrotis is a new genus proposed for *Agrotis rileyana* and correctly so; we have another species that will, I think, prove referable to it.

Pseudorthosia Grt., is properly placed here and its near generic ally *Choephora* finds a place, incorrectly I think, as a synonym of *Episilia* Hbn., which in turn replaces *Pachnobia* Gn., as I have used that term. *Agrotis bollii* Grt., is placed here as *hilaris* Grt., and this

is a surprise in several ways. The insect does not at all agree with the other *Pachnobia* of our fauna in general appearance or habitus and is altogether out of the faunal range of the genus. Furthermore, *hilaris* was preoccupied in *Agrotis* when described and was therefore a bad name. Mr. Grote himself recognized this and changed the term to *bollii*. As matters then stood the change was correctly and necessarily made and subsequent changes in classification should not be allowed to invalidate a course which was proper when taken. My *Setagrotis terrifica* also finds a place in this composite genus which thereby becomes ever more interesting.

I have not noted, heretofore, that Mr. Hampson rarely recognizes either a W or a K in a specific name — it is almost always a V or a C. Now this is of course entirely right from the view-point of the philologist so far as the W is concerned; but why ignore the K, which does have a right to exist? In some cases the change causes a momentary puzzle, as when *okakensis* is written *ocaccensis*: but the effect is positively startling when we read *vocci* and are expected to recognize *wocki* in that disguise. Wocke is not good Latin, perhaps; but since the practice of naming species after individuals has been recognized, it would seem as though a Latin termination only might be considered sufficient. The same is true when a name is taken from a locality where the language used has no Latin source or where, as in America, Indian tribal or other names are sometimes employed. Changes like those cited make a name irrecognizable without an explanation attached.

Agrotis raza H. S., is made a synonym of *A. quadrangula* Zett., all under *Episilia*, and this is probably correct.

Lycophotia Hbn., as used by Hampson includes among others, *Peridroma* Hbn., *Setagrotis* Sm., *Agrotis scandens*, and many of the species I call *Noctua*; so there is also quite a range, generic and specific under this term. Haworth's name *margaritosa* replaces *saucia*, though the former is undoubtedly the less usual form of the species. *L. infecta* Ochs., replaces our *Peridroma incivis* Gn., perhaps correctly. I did not feel at all sure on this point in 1893, and such South American forms as I have seen, do certainly indicate two species. *Adita chionanthi* A. & S., remains solitary. My genus *Platagrotis* is replaced by *Aplectoides* Butler, a generic term that I had overlooked, and only our American species belong to it. So *Ufeus* remains as in our lists. *Hadena cvelina* French, is placed in *Anytus*, erroneously I think: but

then Hampson did not know of the relationship between *Fishia* and *Aporophila*, nor of the species recently described by me. The reference to *Anytus* is certainly better than that to *Hadena*. *Anomogyna* Stgr., receives our species *infimatis* and *vernilis*, which may be correct, for they do offer differences from the other species that I referred to *Setagrotis*. As to *Platagrotis sincera* I am more sceptical. *Richia* Grt., is used as in my recent list and *Trichorthosia* also stands as before. *Mythimna* Ochs., includes the species of *Pseudoglæa* Grt., *Mesogona oxalina* Hbn., to which *intexta* Harv., is cited as a synonym and also the species referred by me to *Semophora* Steph. It is of course a question of generic division and I would hold the two series apart. As to the terms to be used, that will be dependent upon a verification of the types of the genera under the rules of the Ornithologist's Union. *Triphæna* Hbn., is made to include my *Abagrotis erratica* which forms a section by itself as against thirty or more other species; a pretty fair indication, I think, that my genus is a good one. Though *Rhynchagrotis* is not cited as a synonym of *Triphæna* yet all the species I placed in it, save one, now find a home in the latter genus. I am not quite ready to agree that our American species, which form all save three of the series with dusky hind wings are really congeneric with the five species in which the hind wings are orange and one of which, *interjecta*, is the type of *Triphæna*. *Rhynchagrotis* Sm., is restricted to *gilvipennis* Grt., and *chardynyi* Bdv., which I am pleased to see apart. The interesting feature in this arrangement is that when I first used *Rhynchagrotis* I was considerably in doubt whether *gilvipennis* was really referable to it and I suggested it as a distinct generic type. To find my genus now depending on this species is certainly an unexpected outcome. *Pronoctua* contains only the two American species while *Eucretagrotis* gets two Asiatic additions. *Protagrotis* is a new genus proposed for *Agrotis viralis* Grt., which I believed and yet believe to be a synonym of *Luperina passer* Gn. It finds its place in the Agrotids because it has one spine between the middle and terminal spurs of the hind tibia.

This ends the regular series; but the "addenda and corrigenda" make some changes. *Chloridea armigera* which was at least partly recognizable is changed to *C. obsoleta* Fabr., as which we will have to recognize it in future. *Apharetra* Grt., heretofore treated as an Acronyctid is found to have spinose mid and hind tibiæ and to belong near to *Anytus* rather than to the customary position.

The list of unrecognized species is remarkably small and it contains some names of species which were described by me since I sent my contributions to Mr. Hampson. It will be my pleasure to add to the British Museum series in this direction.

Altogether the book is an excellent one. I have been very free in expressing dissent on some points, but that makes nothing against its general value So far as the generic differences go, these are so largely matters of personal opinion that a dissent from a conclusion is not necessarily even a criticism. On the question of identity of species and consequent synonymy there has been little disagreement between Mr. Hampson and myself and some day we will reach a final agreement on all points. Criticism in the nature of fault-finding or in the expression of dissent is easy; but it is not so easy to present a substitute that is more satisfactory, even to oneself. Without recasting the entire scheme it is almost impossible to avoid using exactly the characters employed by Mr. Hampson. The following table illustrates that point.

NOCTUIDEA.

1. Maxillary palpi present.....HYBLÆIDÆ.
 Maxillary palpi wanting. 2.
2. Frenelum in the female simple. 3.
 Frenelum in the female compound 4.
3. Abdomen with lateral anal pencils of hair.....EUTELIIDÆ.
 Abdomen without anal pencils of hair, primaries with tufts of raised scales in the cell..... STICTOPTERIDÆ.
4. Secondaries with vein 5 weak or obsolescent, from the cross-vein well removed from 4. 10.
 Secondaries with vein 5 moderate or strong, from the cross-vein near to vein 4. 7.
 Secondaries with vein 5 as strong as the others, close to 4 and forming part of the series of the end of the median 5.
 Secondaries with vein 5 as strong as the others, out of the median at or before the division into 3 and 4 HYPENIDÆ.
5. Eyes hairy.....PANTHEIDÆ.
 Eyes naked. 6.
6. Median cell of secondaries very short, veins 2–5 originating close together. EREBEINÆ.
 Median cell of secondaries extends to middle of wing at least, veins 2–5 are not close together at base.....CATOCALINÆ.
7. Retinaculum of the male bar-shaped. 8.
 Retinaculum of the male not bar-shaped 9.
8. Forewings with tufts of raised scales in the cell.....SARROTHRIPINÆ.
 Forewings without such tufts.....ACONTHINÆ.
9. Eyes more or less fringed or lashed.....PLUSIINÆ.

Eyes not so fringed or lashed.... ERASTRIINÆ.
10. Eyes hairy....MAMESTRINÆ.
Eyes naked, with overhanging lashes or ciliæ 11.
Eyes naked, without overhanging lashes or ciliæ..... 12.
11. Primaries subparellel or lanceolate, maculation usually strigate or tending to it; body usually depressed.....XYLININÆ.
Primaries trigonate, maculation of the usual type, rarely strigate; body not depressed.....POLIINÆ.
12. Tibiæ not spinose..... 13.
Some or all the tibiæ spinose..... 14.
13. Colors rarely contrasting, normal maculation usually present; fore tibia rarely armed; front of head not modified; eyes round.....HADENINÆ.
Colors usually contrasting; fore tibia often armed; front of head often modified; eyes tending to reniform..... HELIOTHINÆ.
14. Colors bright; vestiture long fine hair or broad glossy scales; eyes often reniform; fore tibia tends to become abbreviated and armature to consist of stout long claws..... HELIOTHINÆ.
Colors rarely contrasting, vestiture usually a mixture of scale and hair or flattened hair; eyes rarely reniform; fore tibia of normal length, armature usually spinose, not claw-like in character.....AGROTINÆ.

The table is unsatisfactory, because it does not express the relation of the subfamilies to each other. Development has been from the Quadrifids, through the Intermediids, in which vein 5 retained its connection with the median though well removed from 4, to the Trifids where 5 is always from the cross-vein and its direct connection with the median is lost. But this development has been along several lines and, while a certain similarity in structure resulted, this does not indicate real relationship. For instance I see very little connection between the Heliothid series and the Agrotids, though they certainly agree in having spinose tibiæ and naked eyes. But the tibial armature is not the same, especially on the forelegs and the character of the frontal modifications is not the same. Even the vestiture differs and the head and mouth appearances have not the same character.

I can better show in a graphic form my view of the varying lines of development that have given us our present Noctuid fauna. The scheme is subject to change, however, and the terminations employed are not uniform because the divisions themselves are far from being equal in value.

EXPLANATION OF PLATE IV.

A graphic representation of the phylogeny of the groups of the family Noctuidæ, represented as derived from a hypothetical quadrifid ancestor. The groups called Hyblæidæ, Euteliidæ, Stictopteridæ, Hypenidæ, Pantheidæ and Erebeinæ are not included.

NEW LEPIDOPTERA FROM THE UNITED STATES.

By HARRISON G. DYAR, A.M., PH.D.,

WASHINGTON, D. C.

Family PYRALIDÆ.

Scoparia torniplagalis, new species.

Wings narrow; light gray, basal space slightly ocherous tinted, a black subbasal point, incompletely connected to base; t.-a. line strongly oblique, whitish, slightly notched on median vein, black shaded without; a diffuse brown shade spreads from the black color to the disk. Reniform marked by a fine, irregular black X-mark. T.-p. line narrowly excurved over cell, else nearly straight, whitish, narrowly black edged within. A black shade at tornus and small dot opposite center of outer margin. Hind wing pale whitish, smoky on margin. Expanse, 17 mm.

Two specimens, Seattle, Washington (O. B. Johnson).

Type. — No. 7886, U. S. National Museum.

Sarata rhoiella, new species.

Fore wings with 11 veins, 4 and 5 separate; hind wings with 8 veins, cell normal, 2 near angle; labial palpi porrect, somewhat triangularly scaled, thick; maxillary palpi small, not tufted; ♂ antennæ slightly bent, with tufts of small overlapping brown scales on the bend. This agrees with Hulst's description of *Selagia* (Trans. Am. Ent. Soc., xvii, 159, 1890) but not with his synoptic table.

Reddish gray, costa slightly lighter; inner line pale, waved, edged without with a vinous black band that is heavier on the costal half and oblique toward the base. Discal dots distinct, vinous black, separate. Terminal area vinous shaded, becoming black apically, cut by the whitish outer line, which is slightly irregular, but straight in general course, rather broad. Color slightly streaked on the veins in darker. Hind wings light grayish, uniform. Expanse, 23–27 mm.

Ten specimens; eight from Pike's Peak, Colorado, above timber, July 21, 1901, two bred from larvæ on poison ivy, Platte Canyon, Colorado, July 19 (Dyar & Caudell), mixed with *Gelechia ocellella* Chambers.

Type. — No. 7887, U. S. National Museum.

Salebria bakerella, new species.

Fore wings with 11 veins, 4 and 5 separate; hind wings with 8, 3–5 stalked, cell rather short; labial palpi erect, flattened; maxillary palpi pencil-tufted in ♂; antennæ slightly bent at base, apparently with scale tuft.

Head, thorax and fore wings white, strewn with black scales, giving a light gray appearance; scattered pale yellowish scales over area of submedian fold. Lines of the ground color, white, the inner defined by a black costal patch outwardly, widened below, rather oblique, and by a large one inwardly on inner margin, diffused toward base. Discal spots black, narrowly joined, with a paler contiguous spot within. Outer line curved inward strongly at disk and submedian fold, black edged within, slightly so without, widening to a distinct black patch at costa. A more or less obvious diffuse oblique shade from upper part of outer line, obliquely toward inner margin. Terminal line waved. Hind wings nearly white, translucent. Expanse, 23–26 mm.

Three specimens, Ormsby Co., Nevada, July 6 (C. F. Baker).

Type. — No. 7878, U. S. National Museum.

Apparently nearly allied to *odiosella* Hulst, unknown to me, but the colors are strongly contrasted, black and white, not shaded nor brownish as Hulst's description reads. I cannot detect a hair pencil on the thorax in the single ♂ before me.

Salebria furciferella, new species.

Fore wings elongate, costa but slightly arched, 11 veins, 4 and 5 separate, 8 and 9 stalked, 10 connate with the base of the stalk; hind wings with 8 veins, 4 and 5 long stalked, cell rather short; ♂ antennæ bent at base with a full tuft of scales; palpi obliquely ascending, second and third joints straight; maxillary palpi pencil tufted.

Gray, black scales thickly strewn on a white ground; fore wings with a broad, indefinite russet shading along whole length of submedian fold. Wing evenly irrorate; a subbasal half band of russet brown on inner margin, edged by black and white narrowly, succeeded above by an oblique black line that joins a ray in the cell which become furcate, the forks ending in the discal dots. Outer line black, narrow, bent inward on the discal fold and more narrowly on the submedian fold, followed, after a short whitish edge, by an illy defined russet band; terminal line black, scalloped. Hind wings subpellucid whitish with a faint yellowish tinge. Expanse, 23 mm.

Three specimens, Ashfork, Arizona, June 18; Prescott, Arizona, June 20 (Schwarz & Barber). This may be *aliculella* Hulst with the discal ray added.

Type. — No. 7889, U. S. National Museum.

Salebria vetustella, new species.

Fore wings with 11 veins, 4 and 5 approximate at base but separate, 10 approximate at base to the stalk of 8 and 9. Hind wings with 8 veins.

Head and thorax gray, strongly washed with brownish red. Basal space of fore wings solidly red except a narrow space before the black inner band which is broad, diffusely edged, erect, joined above by a narrow black band that is angled inward on the submedian fold. Inner half of median space gray, outer half red shaded. Discal dots obscure, separated, obliquely placed. Outer line faint, nearly lost, pale,

finely dentate, much as in *contatella* Grote but more obscured, especially costally. Hind wings yellowish fuscous, darker at margin. Expanse, 26–28 mm.

Six specimens, Plummers Island, Maryland, April 22, May 20, 23, 1903 (W. V. Warner, Aug. Busck, E. A. Schwarz), Rhinebeck, New York, August 2, 1888 (H. G. Dyar). Much resembles *Meroptera pravella* Grote, but is larger and more distinctly marked with red.

Type. — No. 7890, U. S. National Museum.

Zophodia arreomaculella, new species.

Fore wings with 11 veins, 4 and 5 stalked, 8 and 9 stalked; hind wings with 7 veins, 2 from the angle of the cell, 3 and 4 stalked. Tongue moderate, as long as thorax; labial palpi long, porrect: ♂ antennæ simple, rather lengthily ciliate.

Light gray; black scales on a nearly white ground, with a slight admixture of ochraceous, uniform. A yellow russet spot on inner margin at base; another before inner line, half crossing the wing, preceded by a shorter blackish patch. Inner line white, erect, not distinct, crossed by fine black streaks on vein 1, median vein and subcostal. Discal dots separate, blackish; outer line near the margin, diffused, not contrasted, disturbed by indistinct blackish rays on the veins. A terminal row of dots. Hind wings whitish, fuscous tinged outwardly. Expanse, 19 mm.

One ♂, Bremond, Texas, April 21, 1903 (E. D. Sanderson). It resembles *Dolicorhinia aureofasciella* Rag.

Type. — No. 7891, U. S. National Museum.

Pyla pallidella, new species.

Fore wings with 11 veins, 4 and 5 separate, 10 separate; hind wings with 8 veins, 2 before angle of cell, 3 approximate to the stalk of 4 and 5, cell normal. Labial palpi long, porrect, more ascending than usual and somewhat appressed to front; tongue distinct; ♂ antennæ with basal bend well filled with scales.

Whitish, somewhat silvery shining, washed with russet ochraceous on fore wings completely over basal space, in spots on the median space and in a band beyond the outer line. Inner line outwardly placed, straight, oblique, whitish with a few black dots on the outer edge. Median space powdered with blackish, especially below end of cell and subapically. Discal dots separate, black. Outer line near the margin, straight, only a little incurved on submedian fold, white, narrow, black powdery edged within. Outer half of terminal space white; terminal line black. Hind wings pale fuscous tinted. Expanse, 23 mm.

One ♂, Salt Lake, Utah, June 20 (H. S. Barber). I would think this to be *Lipographis fenestrella* Pack., but it falls in *Pyla* by Hulst's table.

Type. — No. 7892, U. S. National Museum.

Ollia, new genus.

Fore wings with 11 veins, 4 and 5 stalked, 8 and 9 stalked, 10 and 11 from the cell; hind wings with 7 veins, 2 before angle of cell, 3 and 4 stalked. Labial palpi very long, porrect; antennæ in ♂ shortly pectinate and pubescent; tongue invisible.

Ollia santaritella, new species.

White, sides of thorax rosy tinted; fore wings with costal half white, inner half pale rosy ochraceous, separated by a deep red line below median vein that fades outwardly and is lost before margin. Hind wings whitish, translucent. Expanse, 23 mm.

One ♂, Santa Rita Mountains, Arizona, June 7 (E. A. Schwarz).

Type. — No. 7893, U. S. National Museum.

Cabnia, new genus.

Fore wings with 9 veins, 5 and 8 absent, 2 and 3 stalked; a costal fold beneath at base. Hind wings with 5 veins, 3, 5 and 8 absent, 2 well before angle of cell. Tongue very short, not as long as head; labial palpi upturned, the second joint with a tuft below; maxillary palpi simple; ♂ antennæ with the basal joint large, a small prominence at its tip, shaft sinuously bent, then slightly thickened; a few long hairs in the bend.

Cabnia myronella, new species.

Dark cinereous, fore wings even, uniformly colored, slightly frosted by pale scales. Lines fine, obscure, whitish, distinct only on inner half of wing, sinuous, narrow. Hind wing whitish, subpellucid, narrowly pale fuscous at margin before the fringe, which is long, pale. Expanse, 11 mm.

One ♂, Washington, D. C., June, 1902 (Aug. Busck).

Type. — No. 7894, U. S. National Museum.

Class I, HEXAPODA.

Order XI, ORTHOPTERA.

A NEW FORFICULID FROM THE PHILIPPINES.

By A. N. CAUDELL,

WASHINGTON, D. C.

Auchenomus minor, new species.

Antennæ with 19 segments, 1 broad and long, equalling in length that of 2, 3, 4 and 5 combined; 2 very small, but half as long as 3; 3, 4 and 5 subequal in length, less than twice as long as broad; the remainder elongate, growing proportionately longer towards the tip of the antennæ, the terminal one being many times longer than broad, all segments clavate. Pronotum slightly longer than broad, slightly narrower than the head, anteriorly prolonged into a narrow neck and posteriorly broadly rounded, the disk flat, broadly depressed medially. Tegmina about twice as long as the pronotum, apically broadly concave; wings extending beyond the tips of the elytra for a distance equal to the width of the pronotum. Abdomen flattened, segments 3 and 4 very slightly plicate laterally. Pygidium scarcely projecting, apically

subtruncate. Forceps as long as the elytra, moderately slender and incurved and armed on the inner side on the basal half with three or four variable sized teeth, the type specimen having four minute teeth on the right branch and two larger and one small one on the left. Legs moderately long; femora considerably swollen; tarsi covered, especially below, with fine long hairs, the second segment spatulately prolonged beneath the third for half its length. Color, light brownish; antennæ, front of head, tips of the elytra and the dorsal surface of the abdomen a little darker and the projecting portions of the wings lighter. Length, exclusive of the forceps, 7 mm.; antennæ, 7 mm.; elytra, 2 mm.; forceps, 2 mm.

One male, Bacoor, Prov. Cavite, Luzon, P. I.; P. L. Stangl, collector.

Type. — No. 7885, U. S. National Museum.

An additional male from Bacoó, Mindoro, apparently belongs here though the third, fourth and fifth segments of the antennæ are somewhat more elongate and the size is greater, the length, exclusive of the forceps, being 8 mm. and the forceps themselves proportionately longer, measuring 3.5 mm.

This species is apparently very little allied to the only other species of the genus known* but according to deBorman's table† it evidently belongs here.

Class III, ARACHNIDA.

Order II, ARANEIDA.

NEW GENERA AND SPECIES OF NEARCTIC SPIDERS.

By Nathan Banks,

Washington, D. C.

(Plates V and VI.)

The following pages contain descriptions of some new spiders from the United States, and of a few new genera. These have been found in the course of going over my collection in the preparation of a generic synopsis of our spiders, and a catalogue of the species. Probably another similar paper will follow as the work proceeds.

* *A. longiforceps* Karsch, Berl. Ent. Zeit., XXX, p. 89, pl. 3, f. 7, ♂ (1886).

† Das Tierreich, II, 1900.

Notes on a few described species are added, and in some cases figures of some of their important parts.

Gnaphosa utahana, new species.

Cephalothorax yellow to red-brown, the dark V-mark indistinct; mandibles more reddish; legs pale yellowish, metatarsi and tarsi more red-brown; sternum and mouth parts red-brown; abdomen yellowish-brown to brown, rather paler below; spinnerets yellowish. Cephalothorax of usual shape, broad in front, dorsal groove distinct. Legs rather stout, black-haired, no spines under tibiæ I and II, one pair near base of these metatarsi; tibiæ III and IV with 3–3 spines below, and others on sides. Sternum about one and a half times longer than broad, pointed behind. Abdomen about one and a half times longer than broad, much depressed. Posterior eye-row strongly recurved, much longer than anterior row; P. M. E. oval, more than long diameter apart, more than twice as far from larger P. S. E.; A. M. E about diameter apart, much closer to larger A. S. E. Length, 7 mm.

Silver Lake, Utah (Skinner).

Zelotes aprilinus, new species.

Cephalothorax pale yellowish-brown, basal joints of legs similar (as also mandibles); tibia, metatarsus, and tarsus red-brown. Abdomen dark, with a large black spot, covering posterior half, and extending forward in the middle to near base, about one third way from base it gives off a branch each side containing a pale muscular impression, rest of base whitish, abdomen and cephalathorax black-haired, a heavy row of bristles on base of latter. Venter pale, with a blackish U-mark behind; sternum and coxæ pale; all legs with long black hairs. Cephalothorax rather slender narrow in front; eye-region occupying not one half of width of front; the two rows rather widely separate; posterior barely longer than anterior, slightly procurved, P. M. E. large, oval, and almost touching, A. M. E. not half their diameter apart, closer to A. S. E., which are barely larger. Dorsal groove distinct. Sternum one and a half times longer than broad, broadest at coxæ II, tapering and pointed behind. No spines under tibiæ I and II, a pair under base of these metatarsi; hind tibiæ and metatarsi with many spines, but none above. Abdomen fully twice as long as broad, much depressed, truncate at base. Length, 5.5 mm.

From Chevy Chase, Maryland, near Washington, D. C., April, under leaves.

Herpyllus californicus, new species.

Cephalothorax red-brown, mandibles and sternum similar; legs rather paler, especially on tarsi; abdomen dark gray above and below, rather paler on base below. Cephalothorax broad behind middle, narrow in front; dorsal groove distinct; eye-region occupying about one half of width; eye-rows rather widely separate, posterior row straight, barely recurved, P. M. E. oval, more than longest diameter apart, about as far from much larger P. S. E.; A. M. E. large, one half diameter apart, still closer to rather smaller A. S. E. Abdomen large and long, truncate at base. Legs rather slender; metatarsi and tarsi I and II heavily scopulate; one spine at tip under tibiæ I and II; one spine above on base of tibiæ III and IV, three pairs

under tibiæ III and IV, others on sides. Sternum once and one half broader than long, broadest at coxæ II, tapering in front and behind. Length, 12 mm.

One female from Lakeside, California.

Syspira pallida, new species.

Cephalothorax pale yellowish, a brown mark each side on anterior furrows, and fainter ones on other furrows, a blackish patch behind side eyes, and one in middle of head. Legs pale yellow, the femora faintly barred above near tip with blackish, and the hind tibiæ at base and near tip. Mandibles yellow-brown; sternum and venter yellowish; abdomen gray. Legs rather slender, 3–3 spines under tibiæ I and II, metatarsi and tarsi I and II scopulate; tibiæ III and IV with two spines above, and 3–3 below. Anterior eye-row straight, A. M. E. large, about one half diameter apart, much closer to smaller A. S. E., quadrangle of M. E. nearly square; posterior eye-row weakly recurved, barely longer than anterior row, P. M. E. about diameter apart, and a trifle farther from the much larger P. S. E., latter not their diameter from A. S. E. Sternum but little longer than broad, broadest behind coxæ II, broadly rounded behind. Abdomen about one and one half times longer than broad. Length, 12 mm.

One immature specimen from Mesilla Park, New Mexico, 29 January, in a hole in the ground (Cockerell). The only species of this Mexican genus yet recorded from our country.

Lophocarenum frontalis, new species.

Male; cephalothorax yellowish-brown; abdomen black; legs yellowish; P. M. E. more than diameter apart, closer to P. S. E., posterior eye-row slightly recurved. All eyes situate on a large cephalic hump, broadly truncate behind, and connected in front to another hump which projects forward much in front of the mandibles. Legs slender and hairy. Sternum triangular, about as broad in front as anywhere. Female differs from male in reddish-brown cephalothorax, and the posterior eye-row straight, the P. M. E. but little more than diameter apart. Length, ♀ 1.6 mm.; ♂ 1.4 mm.

Taken at Falls Church, Va., under stones in the woods.

Epeira emertoni, new species.

A small species of the size of *E. prompta*, but with the abdomen not high at tip, more convex above, and with a pale median stripe on venter like *E. labyrinthea*: there is, however, no pale spot in black sternum. The abdomen shows a rather broad folium above tapering behind, margined with pale and with a darker central stripe; this folium does not reach base, which is quite pale in the middle. Cephalothorax is pale in middle, dark on sides. The legs are pale, and short; the femora banded with brown near tips, and the tibiæ less distinctly so. The epigynum shows a recurved pointed figure much as in *E. prompta*. The abdomen is not so pointed as in *E. prompta* and *E. vegeta*, nor so high at tip.

Sea Cliff, N. Y.; Washington, D. C., and Auburn, Ala. After his description of *Epeira mormon*, Keyserling speaks of a specimen from the District of Columbia which had a pale median mark on the

venter; this perhaps refers to the present species which has the marks on abdomen somewhat similar; the *E. mormon* from Utah, however, has a different epigynum, differently marked legs, and belongs to a different section of the genus.

Xysticus texanus, new species.

Cephalothorax pale yellowish in middle, with a narrow median brown line, eye-region dusky; a broad rich brown stripe covering the entire sides, unbroken by any markings; mandibles pale yellowish, legs pale yellowish, tibia I jet black, a little black on tip of patella, and tibia II blackish; a pale line above on tibiæ I and II, rest of legs wholly pale and unmarked. sternum and venter pale, abdomen dark grayish-brown above, more blackish around edges, in basal part are two white spots, and behind are several whitish transverse lines. Cephalothorax broad and heavy; quadrangle of M. E. plainly broader than high, A. M. E. rather farther apart than to much larger A. S. E., P. M. E. as close to each other as to larger P. S. E. Anterior legs rather short and heavy, tibia I with 5–5 spines below, metatarsus I with 4–4 or 5–5 spines below, all spines short. Length, 5 mm.

One specimen from San Antonio, Texas.

Readily separated by black front tibiæ and uniform dark sides of cephalothorax.

Misumessus, new genus.

A Thomisid allied to *Misumena*, but differing in having large and prominent spines on femora I and II, and above on tibiæ I and II; cephalothorax and abdomen more spiny than in *Misumena*. It differs from *Diæa* in having the tubercles of S. E. joined by a rounded ridge, and in that the P. S. E. are not larger than the P. M. E.

Type. — *M. oblonga* Keys.

Includes also *M. asperata* Hentz, *M. viridans* Bks., *M. bellula* Bks., *M. pictilis* Bks, and the following.

Misumessus pallidulus, new species.

Cephalothorax grayish on sides, whitish in middle. Abdomen white, with three pairs of small irregular black marks behind, legs, sternum and venter whitish. Cephalothorax and abdomen with many erect spines, one below each P. S. E. is very large, six on clypeal margin, two large ones on mandibles in front; about 3 or 4 large ones on femora I; two above on tibiæ I and II; four pairs below tibiæ I and II; six pairs below metatarsi I and II; besides these large spines, the legs have many small spines or stiff bristles. Length, 4.5 mm.

San Francisco, Calif. Differs from *M. pictilis* in markings of abdomen, and more spiny cephalothorax and legs.

Tmarus minutus, new species.

Cephalothorax reddish, in female unmarked, in male with three pale lines converging behind, one median and one each side from P. S. E.; S. E. on large white tubercles. Mandibles reddish; abdomen of female reddish, unmarked; of male yel-

lowish, with a faint brown stripe each side. Venter pale, with a white line each side; sternum and legs pale yellowish, unmarked. Cephalothorax longer (proportionately) than in *T. caudatus*, high till near abdomen, then suddenly falls off. Abdomen truncate at base, about twice as long as broad, but little broader in middle, pointed behind, slightly, although distinctly elevated in a small cone in female, in male simply high at tip. Legs slender, but rather short, very hairy, with but few spines, most prominent on metatarsi I and II. Length, male, 2.4 mm.; female, 3 mm.

Several specimens taken near Washington, D. C. in May, under rubbish on the ground. Distinct by its much smaller size as well as other characters. One specimen has the sides of cephalothorax and abdomen dark-brown.

Apollophanes texana, new species.

Cephalothorax yellowish, slightly mottled with brown on sides, and two approximate dark marks on base of cephalic part, clypeus and mandibles pointed with brown; legs pale yellow and pointed and spotted with brown, especially on femora and tibiæ; these markings faintly indicate a subapical band on femora and a basal band on tibiæ. Sternum and venter pale. Abdomen pale, with a basal brown spear-mark, and behind two more or less connected rows of blackish spots. Cephalothorax but little longer than broad, scarcely noticeably so. Abdomen about twice as long as broad. Legs long and slender; leg I a little longer that IV, tibia I with 3–3 spines beneath, the last short and apical; sternum as broad as long; hind coxæ separate. Eyes of posterior row strongly recurved, and about equidistant; A. S. E. a trifle closer to P. M. E. than to A. M. E. Length, ♀ 6 mm., ♂ 5.2 mm.

One pair from San Antonio, Texas. Differs from the two Mexican species in larger palpal organ, and less slender process at tip of tibia, and the style is longer.

Scaptocosa, new genus.

Differs from *Lycosa* and *Trochosa*, as well as our other Lycosids in lacking spines above on tibiæ III and IV, either at base or middle; these joints being clothed above with long hair. Head high and large, sides sloping; anterior eye-row scarcely wider than second row; eyes of second row scarcely diameter apart. Tibia I densely hairy below, with 3–3 spines, tibiæ IV with 2 short spines on each side. Spinnerets all short, subequal.

Type. — *Lycosa arenicola* Scudder (*nidifex* Marx).

Also contains *L. missouriensis* Banks (*domifex* Hanc.). This species has nothing to do with *L. fatifera* Hentz, which Hentz compares to *L. carolinensis* and says is from Massachusetts. *L. fatifera* can thus only be *L. tigrina* McCook (*vulpina* Emer., *oblonga* and *exitiosa* Bks.).

Allocosa, new genus.

Tibiæ III and IV with a basal spine above; tibia I, with 3–3 short spines below; eyes of second row less than diameter apart; first row plainly wider than

second; tarsi not distinctly scopulate; spinnerets all short; cephalothorax devoid of median pale mark.

Type. — *Lycosa funerea* Hentz (*nigra* Stone).

Contains also *L. sublata* Montg., which I have from Florida.

Lycosa apicata, new species.

Cephalothorax pale reddish-brown, an indistinct brown stripe each side with irregular edges, leaving a wide dorsal space, on cephalic part very broad and containing a narrow brown line each side from the posterior eyes. Eyes on black spots; mandibles red-brown; clypeus black in middle, a white stripe starting above first eye-row passing up between eyes of second row, then back on head. Legs pale yellowish; anterior femora very faintly barred with brown above; hind femora more distinctly marked; tibia IV has below two broad jet-black spots, one at base, other at tip, in both sexes; metatarsi IV black at tips. Abdomen pale brown above, thickly marked with blackish, a basal spear-mark, and spots (connected) each side and behind. Sternum, coxæ (below), and venter (wholly) jet-black. General structure of *L. riparia*; legs rather slender; tibiæ I and II with 3-3 long spines below, rather longer than width of joint. First eye-row procurved, M. E. larger than S. E.; eyes of second row not diameter apart. Length, ♂ 13 mm.; ♀ 15 mm.

Male from Tucson, Arizona, female from Brazos Co., Texas; also two broken specimens from Las Cruces, New Mexico, and immature specimens from Las Vegas, New Mexico.

Lycosa baltimoriana Keys., L. lenta Hentz.

These two species are closely allied. The male palpi are extremely similar. There are certain color distinctions that appear constant. In *L. baltimoriana* the patellæ are dark, and black beneath; the genital area on venter is wholly pale; there is a dark line on outside of femora I and II, while hind femora are barred. In *L. lenta* the patellæ are pale beneath, the genital area on venter is dark in middle, and the femora are unmarked. *L. baltimoriana* is known to dig holes, and I have it from Rhode Island south to Virginia, *L. lenta* has not been reported to live in holes, but may do so, and is common from South Carolina into Florida and Louisiana. I have seen a Florida male which is as pale above as *Trochosa cinerea*, and evidently lived upon the white sand.

Pardosa parvula, new species.

Cephalothorax rather uniform yellowish-brown, a paler median stripe; eyes on black spots. Mandibles pale yellowish-brown; sternum pale yellowish. Abdomen pale, with a basal brown spear-mark, and a large dark spot behind. Legs pale, anterior femora slightly infuscated. Male palpus with black hair on femur; snow-

white hair on patella and tibiæ, but the latter has a patch of black hair at base nd at apex below; tarsus white, palpal organ reddish. Legs long and slender, with long spines. Structure similar to *P. minima*. Length, ceph., 1.8 mm.; abd., 1.5 mm.

A male from Altoona, Florida (Dobbin).

Pardosa texana, new species.

Cephalothorax pale yellowish; head black and narrowly indented behind in middle; an irregular brown, curved stripe each side, leaving a very broad pale median area, broader than in any other species known to me. Clypeus and mandibles pale, unmarked. Abdomen pale, marked with black, a large oblong black spot on middle near, but not at, the base, and many irregular spots and dashes, some connected to the median spot. Legs pale, two distinct black bands on femora, two on tibiæ, metatarsi marked at base and tip, patellæ with a dark spot each side. Sternum black, with a small pale triangular spot in middle of base; lip dark, apex pale; coxæ and venter pale, unmarked. Length, 6.5 mm.; hind leg, 14 mm.

Brazos Co., Texas, several.

Pardosa milvina Hentz.

Cephalothorax pale yellowish, eye-region black, two dark brown stripes extend back from eye-region, approximate behind, so as to narrow the pale median stripe. Clypeus pale, with a black spot each side; mandibles pale, with a dark band across near tips. Abdomen above brown or black, dotted with pale, and a median stripe with irregular margins from base to tip. Legs pale yellowish, spotted and banded with black; three or four bands on femora and tibiæ, less distinct beyond, and usually not distinct below; a mark above on each coxa. Sternum and venter both pale, without markings. Shape and structure similar to *P. flavipes* Keys. Length, ceph., 2 mm.; abd., 2 mm.

Brazos Co., Texas; Shreveport, La., Auburn, Ala., and elsewhere. Agrees best with *L. milvina* Hentz, of anything I know of in the South. Hentz says the under-side was pale, so he could not refer to *P. flavipes* which has a black sternum. It is a very common species south.

Phidippus basalis, new species.

Cephalothorax dark red-brown, black on eye-region; mandibles nearly black, not iridescent; sternum and maxillæ dark red-brown; venter dull blackish. Legs dark red-brown, tarsi pale, and hind legs with a broad pale band on base of tibiæ and metatarsi. Clypeus with grayish hair. Abdomen black, with a broad basal band of yellow scales; behind on the sides is a transverse white spot, and between them two white dots, behind middle on the sides is an oblique white spot, and a pair of smaller ones over spinnerets. Legs rather long, with many white hairs, patellæ and tibiæ I with long whitish hair below, mostly black hair above. Length, 12 mm.

One female, from Arizona (Townsend). Distinct by basal yellow band, and four or six white spots on abdomen.

Sidusa Peckham.

This genus is near *Mævia* Koch. In our species the eye region is a little broader in front than behind, and occupies scarcely one third of the length of the cephalothorax. There are but 3–3 spines under tibia I and the basal one of inner series is near base; metatarsus IV heavily spined near base, middle, and tip; spines on patellæ III and IV; and coxæ I rather widely separate. *Astia morosa* Peckham falls in this genus, and has an epigynum extremely similar to that of certain Mexican forms. Two other species are known to me.

Sidusa arizonensis, new species.

Cephalothorax dark brown, scarcely paler behind, clothed with white and black hairs, a row of white over first eye-row, more golden below dorsal eyes. Abdomen black, with white and black appressed hairs, more golden around base. Legs pale yellowish, blackish at bases and tips of the joint. Sternum pale brownish; venter whitish, unmarked. Cephalothorax about one and one half as long as broad, broadest in middle, not depressed; eye-region one third broader than long, a little broader in front than behind. Abdomen longer than cephalothorax, about one and two thirds as long as broad, not depressed. Leg I not much thickened; spines as in the genus. Epigynum shows two large contiguous nearly circular cavities, in the inner basal part of each is a rounded reddish elevation. Length, 5 mm.

One female from Arizona (Townsend).

Sidusa borealis, new species.

Eye-region black, concave behind, thoracic part pale reddish brown, darker on posterior part; clypeus brown; mandibles brown; legs yellowish brown; leg I rather darker, and all femora darker than other joints, no bands. Abdomen black at extreme base, then a curved transverse whitish band (not very clear); behind in the middle is a broad pale stripe to tip (not very distinct); and on each side is a broad black stripe containing two white dots, one beyond middle, and the other (smaller) close to tip. Sternum and venter pale. Abdomen pointed at tip, not depressed. A row of bristles over first eye-row. Leg I not much thickened, tibia I fully three times as long as broad; all legs with many stout spine, as in the genus. Male palpi very slender, the tibia longer than tarsus, and clothed with long white hair, tarsus on outside with black hair; palpal organ simple; a short spur at tip of tibia. Length, 5–6 mm.

Two males; one from Ithaca, N. Y., the other from Falls Church, Va.

Icius texanus, new species.

Cephalothorax dark red-brown, black in eye-region, clothed with yellowish scales, and white ones over first eye-row; a white line along the lower margin. Abdomen a uniform pale brown above, with a narrow white line around base and sides, clothed with white scales. Legs pale yellow, front pair more brownish, all unmarked. Sternum pale brown; venter pale yellowish. Cephalothorax one and one half times as long as broad, broadest behind eye-region; latter broader behind than in front, occupying almost two fifths of cephalothorax; eyes of second row one half

way between dorsal eyes and A. S. E. Mandibles small, vertical. Sternum twice as long as broad; coxæ I separated by less than width of lip. Leg I not much longer than others, much thickened; 3–3 spines under tibia, the basal of inner series at basal third; 2–2 stout spines under metatarsus I; metatarsus IV spined only at tip; all legs with few hairs; no patellar spines; leg IV very slender. Epigynum shows two rather widely separate small holes and behind a group of five dark marks. Length, 4.5 mm.

One specimen from Edinburg, Texas.

Erematttus, new genus.

Allied to *Marpissa*, but differing in having but one (or none) spine under tibia I, this very short and near tip. Cephalothorax long and flat; eye-region occupying about two fifths of length, rather broader behind than in front; legs short and stout, leg I thickened; anterior coxæ separate by less than width of lip, metatarsus and tibia III and IV with a few slender spines; abdomen rather elongate, and depressed; leg I fringed beneath.

Type. — *Marpissa albopilosa* Banks.

Probably also includes *Icius piraticus* Peck.

Pellenes calcaratum, new species.

Cephalothorax much like *P. cœcatum* Htz., a median pointed black stripe, and lateral black stripes not reaching hind margin; eye-area dark brown, concave behind. Clypeus yellowish brown; mandibles black. Abdomen black above, margined with white, a pair of round white dots near middle (sometimes united) and a median spot behind. Sternum and coxæ pale yellowish; venter pale, with a median dark stripe and one fainter each side. Legs pale yellowish; femur I white below, with long white hair, dark brown in front and behind with a pale stripe above; no fringes under tibia I, no dark lines above, femur III mostly dark brown in front; femur IV dark at tip, also patella IV. A row of bristles over first eye-row. A large flattened spine on inner side near tip of tibia I. Femur III not humped at tip; patella III somewhat swollen toward tip, with a black spot in front below, and above a large long spur; no dark streak above; tibia III constricted at base. Male palpus with snow-white hair on outside of tarsus. What I take to be the female has a white-haired clypeus, three black stripes on the venter, and the femora not distinctly pale on base; otherwise much like the female of *P. cœcatum* Htz. Length, ♂ 4 mm., ♀ 5 mm.

Male and female from Punta Gorda, Fla., and a male from Palm Beach, Fla.

Pellenes californicum, new species.

Eye-region black, rest of thorax pale reddish-brown, clothed with white hair; a median black spot behind, not reaching forward. Abdomen black above, a basal white band, a large transverse spot in front of middle and a large longitudinal spot just behind this, white. Venter pale, with three black stripes, sternum pale. Legs pale yellow; femur I, black above and on outer side, with a fringe of black scales on outer side near tip; patella and tibia I not fringed below, but with black hairs above on outer side; rest of leg pale yellow, with white hairs. Mandibles and cly-

peus brown, rather whitish in middle; tawny hairs over and between A. M. E. Femur III in front with several transverse curved black bars, not swollen at tip; patella III triangular, in front with many brown dots; tibia III with an oblique black line above, a broad pale stripe below this, and rest of front blackish. Male palpus has white hairs on outside of tarsus; a small curved hook at tip of tibia. Length, 4 mm.

One male from San Diego, California.

Pellenes tarsalis, new species.

Cephalothorax black on eye-region, a median black stripe behind, white each side, lower sides of cephalic part with white hair, blackish behind on lower sides. Abdomen black, two white dots over spinnerets, two white chevrons in front of these, and then a double row of (not very plain) dots to base; sides white; venter pale, with three black patches, two behind lung-slits, one at tip. Sternum and coxæ pale yellowish. Clypeus and mandibles white. Legs pale yellowish; femur I with a black stripe above, many black hairs above on patella and base of tibia I, white fringes on sides of tibia I; tarsus I jet black; a dense white brush under femora I and II outside near tip; a black spot at tips of femora III and IV; patella III simple. Male palpus white on outside. Length, 5 mm.

One male from San Pedro, California. Readily known by black tarsus I.

Pellenes arizonensis, new species.

Cephalothorax dark in eye-region and there clothed with golden scales; black stripe behind in middle, and white each side; lower margin broadly white, connected to white clypeus, which has a dense brush of yellowish-white scales in middle, above it are the 8 white bristles. Mandibles dark, clothed with long white hair, and shorter yellowish scales. Red hair around eyes of first row and above them is a broad red band. Abdomen pale yellow with a broad black stripe each side uniting over the spinnerets; venter black beyond lung-slits. Legs pale-yellow; all with many long white hairs; a brush of long black hair under femur, patella, and tibia I, not as long as *P. hirsutus;* fringe above tibia I black at base, nearly white at tip; white fringe above patella I; a brown mark at base of tibia IV; patellæ III unmodified. Male palpus with patella and femur white; tibia has a strong, straight projection. Length, 5 mm.

One male from Arizona (Townsend).

Pellenes klauseri Peckham.

Males agreeing with the description have the patellæ III enlarged on style of *P. peregrinus* P., the projection is more curved and larger, and on internal face there are two black spots below and a subapical blackish line, no stripe above. The anterior face of the tibia III shows a dark line above. The femur is humped at tip. Femur I has an oblique ridge of erect scales on upper inner side toward tip; and on under side near tip is a dense brush, whitish inside, blackish outside; tibia I has two rows of long white scales below, between the rows is a smooth space with the spines.

Males from Denver and Ft. Collins, Colo. Females from the

same localities, having the same abdominal markings, agree well with Peckham's description of *P. dolosus*.

Pellenes cœcatum Hentz.

Females taken on the same spot with males and evidently the same species agrees with Peckham's description of *P. sabulosus*. I have seen males and females from various localities between Long Island, N. Y., and Brazos Co., Texas. In some males the apical apophysis of patella III is a little longer than in others, but palpus and markings are the same.

Pellenes birgei Peckham.

Males from Cañon City, Colorado, agree with the description. They have the tibiæ and patellæ III and IV dark on sides and have a narrow dark line above. Females from the same locality and marked like males, have the clypeal marks and other characters of *P. politus* Peckham, which is based on a female.

EXPLANATION OF PLATES V AND VI.

Fig. 1. *Lophocarenum frontalis*, side of cephalothorax.
Fig. 2. *Lophocarenum frontalis*, palpus.
Fig. 3. *Lophocarenum frontalis*, epigynum.
Fig. 4. *Pardosa texana*, epigynum.
Fig. 5. *Pellenes tarsalis*, palpus.
Fig. 6. *Pardosa milvina*, epigynum.
Fig. 7. *Zelotes aprilinus*, epigynum.
Fig. 8. *Misumessus pallidulus*, epigynum.
Fig. 9. *Sidusa arizonensis*, epigynum.
Fig. 10. *Tmarus minutus*, palpus and epigynum.
Fig. 11. *Herpyllus californicus*, epigynum.
Fig. 12. *Apollophanes texana*, epigynum.
Fig. 13. *Lycosa apicata*, epigynum.
Fig. 14. *Phidippus basalis*, epigynum.
Fig. 15. *Icius texanus*, epigynum.
Fig. 16. *Pellenes californicum*, tibia III.
Fig. 17. *Pellenes calcaratum*, tibia III.
Fig. 18. *Sidusa borealis*, palpus.
Fig. 19. *Pellenes calcaratum*, palpus.
Fig. 20. *Apollophanes texana*, palpus.
Fig. 21. *Lycosa apicata*, palpus.
Fig. 22. *Pellenes arizonensis*, palpus.
Fig. 23. *Allocosa sublata*, palpus.
Fig. 24. *Pardosa parvula*, palpus.
Fig. 25. *Pellenes californicum*, palpus.
Fig. 26. *Gnaphosa utahana*, epigynum.

ARTHROPODA: General.

THE TYPES OF GENERA.

BY HARRISON G. DYAR AND A. N. CAUDELL,

WASHINGTON, D. C.

It is a self evident proposition that no stable nomenclature can result until the types of all the older genera are definitely fixed. The American Ornithologists Union's code decides that this shall be effected by the method of elimination, and the last quarter of a century has seen numerous attempts in this direction. The results, however, have not equalled the expectations; stability is apparently further off than ever. We are aware of several instances where every author that has dealt with a certain genus has arrived at a different species as the type, all proceeding by apparently the same method. In fact the method contains a fatal defect in that it tacitly requires a complete knowledge of all the literature, a thing most difficult to attain. Moreover the method is extremely laborious and requires a great expenditure of time over a matter entirely subsidiary to the end in view, which is after all the study of organic nature, not the study of a set of names. Mr. F. Pickard Cambridge says:* "Elimination pure and simple in its practical application almost invariably lands us in an absurdity. In this way, the species which the authors withdraw are usually those that are best known, with characters salient and well described, leaving in those least known, with this result, that the last species left in is one which is not known, is badly described, and never likely to be identified with any certainty; and this miserable phantom is left us as the type of the genus."

After consideration, we believe that the method of first species is the only practical way of determining types and we have in mind the revision of certain orders of insects on this basis. The Sphingidæ have been thus revised by Rothschild and Jordan,† but two of their rules seem to us unwarranted. The ruling requiring generic terms to be verbally defined we would not defend nor adopt. A genus is suf-

* Ann. Mag. Nat. Hist. (7), viii, 403, 1901.

† Revision of the Sphingidæ, Nov. Zoöl., ix, Supplement, 1903.

ficiently defined by the citation of one or more described species. Since no generic description is ever absolutely complete and the majority are utterly useless to the monographer it is an arbitrary act to require any verbal description. A species, of course, stands on a different basis. Rothschild and Jordan's other rule that a genus is a synonym of an earlier one if it contains the type of the latter is likewise unnecessary. If both are founded on the same type species they are of course synonymous; but if they have different types, both may well be recognized, even though proposed to contain the same original species. In this we agree with the American Ornithologists Union's code.* The following is our proposed method:

We accept the American Ornithologists Union's code with the following exceptions. Canons XXI, XXIII, XXIV, XXXVI and XLV are rejected. Canon IV is acceptable except that we would fix the endings also for tribes and superfamilies; canon V, except that the name is to be taken from the oldest included genus; canon VIII, except that the agreement with the supposed gender of the genus is not necessary; canon IX, except that varietal names are retained; canons XVII and XVIII, except that we recognize absolute priority; canon XXXVII, except that a generic name must be based only on a species previously or contemporaneously defined; canon XL, except that typographical errors are accepted unless they introduce into a name characters not in the Latin alphabet. In such cases we would amend so far as to substitute the Latin equivalent, if there is one. If there is none, the name must be rejected.

In another form our ideas may be thus expressed:

1. Generic and specific names are to be written as originally proposed without emendation unless they contain characters not in the Latin alphabet or are not binomial.

Letters of the Latin alphabet are to be substituted for foreign characters if there is an equivalent. W is the only English letter not found in Latin.

2. Generic names are considered to be founded on one species only. When the type species is not designated by the original author the first species is to be regarded as the type.

Species marked definitely by the author as unknown to him should not be taken as types. The figuring of a species is a virtual designation of type.

*The following papers may profitably be consulted on this subject: Kirby, Proc. Ent. Soc. Lond., 1868, p. xlii; Cook, Science, N. S., xv, 646, 1902; Rothschild & Jordan, Nov. Zoöl., ix, Suppl., 1903.

3. A generic name need not be accompanied by any verbal description. It is considered to be founded in the sense of rule 2 if accompanied by the names of one or more described species in a published article.

If there is no species mentioned, or those mentioned are not then or previously characterized, the name is invalid, even though accompanied with a description.

4. Names proposed as subgeneric or subspecific are to be treated as if of generic or specific value.

5. A specific name to be valid must be accompanied by a description or a figure or such data as will separate it from the other species of the genus then known.

The citation of type specimens in a collection does not constitute definition. We regret that it is impossible to differentiate between adequate and inadequate descriptions. The only place where it seems that a line can be drawn that is not too much subject to individual interpretation is between an attempt at a description, however feeble, and none at all.

6. Superfamily, family, subfamily and tribal names shall be formed from the oldest valid generic name included in their respective groups by the following endings: -oidea, -idæ, -inæ, and -ini respectively.

If the genus on which the higher name is founded becomes invalid, the higher name is to be changed, following that of the next oldest genus and not the one that may be substituted for the oldest.

JOURNAL

OF THE

New York Entomological Society.

Publishes articles relating to any class of the subkingdom Arthropoda, subject to the acceptance of the Publication Committee. Original communications in this field are solicited.

Editorial.

In the course of some remarks on the synonymy and classification of the Noctuidæ, which we print in this issue, Dr. John B. Smith calls attention to certain violations of the rule "once a synonym, always a synonym" and protests, somewhat too mildly we think, against the practice. We are in entire agreement with Dr. Smith in this case, but would insist more strongly upon the point. The use of a certain combination of generic and specific names should preclude the subsequent use of the same combination in any other sense, and a specific name once changed for this reason, cannot subsequently be resurrected, even though removed to another genus.

In another part of his remarks, Dr. Smith queries why his erroneous synonymy of *Agrotis clandestina* Harr. was followed in Bulletin 52, U. S. National Museum. We may be permitted to say, on behalf of the author of the Bulletin, that the point was overlooked. Dr. Dyar would have been pleased to correct the synonymy if he had happened to notice the error.

Again Dr. Smith argues for the retention of the letters *w* and *k* as originally used in scientific names. We are pleased to see this matter discussed, for these changes are frequently disconcerting, as Dr. Smith shows, and we hope that some excuse can be found for avoiding them. We think Dr. Smith is justified in claiming a different standing for the letter *k* than for *w*, for *k* did not occur in the old Latin alphabet and was retained in later Latin in one word at least and as an abbreviation. The whole matter rests upon the interpreta-

tion of the rule that names must be in Latin form. We certainly hope that the view may prevail that the occurrence of some generally used letters in the body of a name may be regarded not to violate the rule, even though these letters may be doubtfully found in the Latin alphabet. We would, however, advise authors who are proposing new names, to bear this matter in mind and avoid the use of those letters against which objection may be urged.

Still another matter touched on in Dr. Smith's suggestive remarks is the question of taking as the type of a genus, the first species mentioned when the type has not been fixed by the author. This method, adopted by Hampson, has likewise been used by Rothschild and Jordan in their great work on the Sphingidæ. It is, we think, the method that will ultimately come into vogue. We remark on this subject more fully in the preceding article.

PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY.

MEETING OF DECEMBER 1, 1903.

Held at the American Museum of Natural History, 77th St. and 8th Avenue. President C. F. Groth in the chair with 12 members present.

Mr. George P. Engelhardt gave an account of a two week's collecting and pleasure trip in West Virginia during the month of August this year. He gave a general description of the character of the country through which they passed, and detailed some of the pleasant experiences while afoot. Some of the places visited were ideal collecting grounds and he was able to capture a number of interesting insects, which were exhibited. Among these were two males of the parasitic hymenopteron *Pelecinus polyturator*.

Mr. C. T. Brues presented a paper on "The Relations of Myrmecophilous Insects to their Host Ants." He referred especially to the factors which produce a resemblance between the ants and their guests, pointing out the fact that in the case of the blind ants the color resemblance must be due entirely to factors outside of the nest. This view is different from the one recently advocated by Wasmann.

Specimens of several species of the blind legionary ants (*Eciton*) were exhibited together with a number of their guests.

MEETING OF DECEMBER 15, 1903.

Held at the residence of Mr. Gustav Beyer, 511 East 117th St., Tuesday evening President C. F. Groth in the chair with 11 members in attendance.

Through Mr. Groth, Mr. A. C. Clarkson presented to the Society six bound volumes of the New York Journal (1893–1898) which belonged to his late brother.

The librarian, Mr. Schaeffer, announced the receipt of the Zoölogical Record for 1902.

The secretary read an announcement of the plan to publish, conjointly with the other societies of the Scientific Alliance and other scientific institutions of New York City, a weekly bulletin which besides detailing the programs of the societies will include any matter of scientific interest to the affiliated societies.

On motion of Mr. Palm the Society voted to approve the plan as outlined in the letter from the Secretary of the Scientific Alliance.

On motion the President appointed a nominating committee of three, as follows: Messrs. Barber, O'Connor and Love.

Mr. C. Schaeffer exhibited a specimen of the typical form of *Onus laevis* which he had received from California, also *Neoharmonia ampla* Muls., which is a new addition to our fauna.

ANNUAL MEETING, JANUARY 5, 1904.

Held at the American Museum of Natural History. President C. F. Groth presided with 14 members present.

The minutes of the two previous meetings were read and approved.

The resignation of Mr. E. J. Huntington as an active member of the society was accepted.

The treasurer, Mr. L. H. Joutel presented his annual report, showing that the society had a balance of $885.64.

The librarian, Mr. C. Schaeffer, reported that during the year 1903 he had sent out 15 entire sets of the Journal, 14 single volumes and about 45 single numbers besides the regular subscriptions which contains 161 names. 17 new subscribers had been added and 9 names dropped.

The following exchanges have recently been received:

Illus. Zeitschrift. f. Entomologie, Nos. 5–15.

Histoire Physique, Naturelle et Politique de Madagascar, Vol. XXVII.

Mittheilungen der Schweizer Entom. Gesellschaft Illustrierte Zeitschrift f. Ent., Nos. 5–15, 1903.

Mr. J. R. de la Torre Bueno presented the following resolutions on the death of our esteemed member, Thomas D. O'Connor.

"WHEREAS: It has pleased God to take our friend and fellow-member Thomas D. O'Connor; and

"WHEREAS: In the time he was of our membership he endeared himself to all by his unfailing courtesy and kindly spirit; be it

"*Resolved*: That the New York Entomological Society mourns the loss of one, who in all his ways showed himself a true gentleman, a sincere friend, and a valuable member, and be it further,

"*Resolved*: That these resolutions be made known to the family of our regretted fellow-member, and that the sympathy of the Society be extended to them in their affliction."

Moved by Dr. Love that these resolutions be placed in the Minutes and a copy of these be forwarded to the relatives of the deceased. Seconded and carried.

The secretary read the report of the committee placing in nomination the following ticket:

President — C. H. Roberts.

Vice-President — C. W. Leng.

Corresponding and Recording Secretary — H. G. Barber.

Treasurer — W. T. Davis.

Librarian — C. Schaeffer.

Executive Committee — Messrs. Southwick, Joutel, Groth, Watson and Beyer.

Publication Committee — Messrs. Leng, Dyar, Schaeffer and Brues.

No other names be being presented in opposition, on motion, the secretary was instructed to cast the unanimous ballot of the Society for each of the nominees as presented by the committee for the respective offices.

Mr. Groth in resigning the chair to his successor made a few remarks to the members, thanking them for their kindly help and support during his term of office.

Mr. Weeks moved that the thanks of the Society be tendered to the outgoing officers for their zeal in the performance of their duties. Seconded and carried.

MEETING OF JANUARY 19, 1904.

Held at the American Museum of Natural History. C. H. Roberts presided with 15 members present.

The minutes of the last meeting were approved.

The president appointed the following standing committees for 1904:

Auditing Committee — Messrs. Barber, Schaeffer and Southwick.

Field Committee — Messrs. Bueno and Davis.

Delegates to the Scientific Alliance — Messrs. Love and Groth.

The librarian, Mr. C. Schaeffer, reported the receipt of the following exchanges:

Canadian Entomologist, Vol. XXXVI, No. 1.

Wiener Ent. Zeits., IX and X, 1903.

Deutsche Ent Zeit., 1891, No. 1; 1892, Nos. 1 and 2; 1895, No. 2.

Mr. Beutenmüller (chairman of the publication committee of 1903) communicated his report through the secretary as follows: "Four numbers of the JOURNAL were published during 1903, viz., March, 60 pages, 4 plates; June, 56 pages, 3 plates; September, 60 pages, 2 plates and December, 74 pages, six plates; making a total of 274 pages and 15 plates for Volume XI.

Mr. Groth moved that the JOURNAL of the Society be furnished to active members free of charge. Seconded. Discussion by Messrs. Groth and Comstock.

On motion of Mr. Weeks the motion was placed on the table until the next meeting.

Mr. Schaeffer exhibited a series of *Cicindela scutellaris* var. *rugifrons* and var. *modesta*, showing every gradation of markings from nearly immaculate to forms with the markings broadly confluent at sides. Both *modesta* as well as *rugifrons* with the markings broadly confluent were all from Cold Spring Harbor, Long Island. Mr. Schaeffer remarked that it was strange that all of the specimens which he has seen from this locality have the markings very broad or confluent at side margin, while from he Aqueduct, Long Island, locality the specimens are more feebly marked and occasionally entirely unicolorous specimens are found with them. *Cicindela hirticollis* from unicolorous to fully marked specimens were also exhibited. They were all collected at different beaches on Long Island. The unicolorous and darker as well as the more fully marked specimens occur together with the full marked forms near the beach and are in no way confined to mud flats only.

Mr. Jacob Doll exhibited the following species of Lepidoptera collected or bred by him at Brownsville, Texas, last summer: *Alypia disparata* and larva, *Ciris wil-*

sonii and larva, *Horama texana*, *Copidryas cosyra*, *Euchætes spraguei*, *Euchætes murina*, *Halisidota seruba* with larva and cocoons, *Ecpantheria muzina* with larva and pupæ, *Ecpantheria* sp. new to our fauna, *Carama cretata*, with larva and cocoon, *Lagoa opercularis* with larva and cocoon, *Schizura* sp. with larva, new to our fauna, *Cerura scitiscripta* with larva and cocoon, *Sphingicampa hoegei* (?) with larva and pupæ, *Saturnia galbina* and their cocoons formed in a mocking bird's nest.

Mr. Bueno made some remarks concerning the Hemiptera-Cryptocerata. He mentioned the literature concerning all of the families of the group and spoke of the necessity for much systematic and monographic work in certain of these. He exhibited a series of specimens to illustrate the life-history of *Pelocoris femorata* Pal.

MEETING OF FEBRUARY 2, 1904.

Held at the American Museum of Natural History, Tuesday evening. President C. H. Roberts in the chair with thirteen members and two visitors present.

In the absence of the secretary, Mr. Weeks was appointed secretary pro tempore.

Mr. Leng, of the publication committee, reported that at a meeting of the committee held this evening Dr. Harrison G. Dyar had been elected editor of the JOURNAL for the coming year. Also that arrangements would be made to have separata of important papers printed in such form as to be readily available for sale or distribution.

Mr. Groth requested that action upon his motion laid over from the last meeting be deferred until next fall.

Mr. E. B. Southwick read a paper upon "Cleaning of the Central Park Ponds for the Prevention of the Mosquitoes." He gave an account of how the work was carried on during the past summer and explained some of the difficulties of the undertaking. While there were some mosquitoes in the park there were not nearly as many as had been claimed. These were principally *Culex* with very few if any *Anopheles*. The ponds were well populated with fish which consumed the larvæ.

Mr. Southwick exhibited a copy of Dr. Berkeley's work on Mosquitoes. Discussion by Messrs. Roberts and Weeks.

Mr. Watson exhibited the pupa and a bred specimen of *Feniseca tarquinius* and gave the following notes concerning the species: "On July 4, 1903, the butterfly was found in every stage in the vicinity of Ramapo, N. J. The larvæ were found feeding on colonies of lice (*Schizoneura tessellata*) on alder." He understood that the insect had been found during the winter in all stages except the imago.

Mr. Weeks stated that some years ago he took a specimen of this butterfly near Grasmere, Staten Island, being the first recorded capture of this insect on the island.

Mr. Wm. T. Comstock presented some "Notes on *Melitæa phaëton*," and in connection therewith exhibited a series of specimens including not only the normal form, but also a specimen approaching in maculation the variety *superba*, having the white spots more or less confluent instead of distinctly separate, and *phæthusa*, in which the white spots were almost obsolete and the secondaries, save for the marginal yellow dots, with faint traces of a few white spots, were uniformly black. In the primaries also the white spots were to a great extent markedly absent. Of the variation *streckeri* he had not been able to secure a description. Mr. Comstock drew attention to the method in which the series of *M. phaëton* were mounted for preservation and ready inspection.

Mr. Comstock expressed his opinion that local variations were not entitled to a

specific name, but should be merely noted as variations though suggesting no method of identification, as to the extent and limitations of varietal nomenclature. Discussion by Messrs. Dyar, Bueno, Brues, Davis, Roberts, Schaeffer and Weeks.

Dr. Dyar thought it advisable that insects, admittedly of the same species, but possessing differences in maculation and coloration which identified them in accordance with their local or geographical distribution, should receive distinct names; such names often serving to distinguish the habitats of the several races of a species.

MEETING OF FEBRUARY 16, 1904.

Held at the American Museum of Natural History, Tuesday evening. President C. H. Roberts presided with nine members and two visitors present.

The librarian, Mr. Schaeffer, reported the receipt of the following exchanges:

Zeitschrift f. Entomologie, Breslau, 1903, No. 28.

Allgem. Zeitt. f. Entomologie, Vol. VIII, Nos. 22, 24.

Canadian Ent., Vol. XXXVI, No. 2.

Dr. E. P. Felt, New York State Entomologist, gave an informal talk on the subject of "Recent Investigations of New York Insects," illustrated with lantern slides. His remarks pertained chiefly to the three following insects: The apple bucculatrix (*Bucculatrix pomifoliella*), the grape-vine leaf-hopper (*Erythroneura vitis*) and the grape-vine root-worm (*Fidia viticida*).

A number of slides were shown to illustrate the various stages of these insects as well as their characteristic workings and appliances for combating them.

On motion of Mr. Groth a vote of thanks was tendered Dr. Felt for his interesting lecture.

MEETING OF MARCH 1, 1904.

Held at the apartment of H. G. Barber, 241 West 135th Street.

President C. H. Roberts in the chair with twelve members and one visitor present.

The treasurer, Mr. Davis, reported that the Society now had a balance of $1,024 in the bank.

Dr. Love moved that the annual dinner be held as usual this year and that a committee of three be appointed to make arrangements. Seconded and carried.

Mr. Groth moved that a list of members of the Society, with address and specialty, be printed. Seconded. Amended to include Brooklyn members.

Dr. Love moved that the question be referred to a committee of three for action. Seconded and carried. The Chair appointed the following committee: Messrs. Weeks, Watson and Schaeffer.

Dr. Love suggested the advisability of holding but one meeting of the Society a month, dispensing with the first meeting.

Discussion by Messrs. Love, Davis, Weeks, Roberts, Bueno, Joutel, Comstock and Barber.

Dr. Love moved the adoption of the following resolution, which was duly seconded:

Resolved, That Section 1 of Article 17 of the By-laws be amended to read as follows:

"There shall be held one regular meeting of the Society in each month (excepting July, August and September) on the third Tuesday, at 8 P. M.

Action on this resolution was deferred until next meeting.

H. G. BARBER,
Secretary.

JOURNAL

OF THE

New York Entomological Society.

Vol. XII. SEPTEMBER, 1904. No. 3

Class I, HEXAPODA.

Order I, HYMENOPTERA.

THE PHILANTHIDÆ OF NEW MEXICO.—II.

By H. L. Viereck and T. D. A. Cockerell.

New Haven, Conn. Colorado Springs, Col.

Genus CERCERIS Latreille.

Table of Species.

Species red, yellow and black or yellow the predominating color on abdomen. 1.
Species black and yellow or black the predominating color on abdomen 8.
1. Large species, 14 mm. and more..... 2.
Smaller species, 11 mm. and less..... 3.
2. Females, produced portion of clypeus broadly emarginate, forming a low ridge, lateral points broad and short**fidelis.**
Produced portion of clypeus extending beyond the face a greater distance than the length of the scape, broader than long.....**nasica.**
longer than broad.....**morata.**
Males, metathorax with large contiguous punctures, enclosure with smaller contiguous punctures and a central longitudinal, impunctate area which is impressed and highly polished.....**macrosticta.**
3. Abdomen with narrow black bands..... 4.
Abdomen with broad black bands; first segment red 5.
4. Female, produced portion of clypeus little longer than broad..... .**platyrhina.**
Males, petiole of abdomen distinctly longer than broad, metathorax largely red. **ferruginior.**
Males, petiole not distinctly longer than broad, metathorax without red..**garciana.**
5. Metathorax black..... 6.
Metathorax (except enclosure) red..... 7.
6. Larger; enclosure of metathorax smooth and shining; scutellum not spotted. **populorum.**

Smaller; enclosure of metathorax transversely ridged; scutellum with two yellow spots **rufinoda.**

7. Clypeus of female black; pygidial plate truncate var. **crucis.**
Clypeus of female white; pygidial plate narrowed and rounded at end. **crotonella.**

8. Scutellum with two light spots 9.
Scutellum without spots 13.

9. Femora black with yellow or whitish markings; stigma piceous or brown 10.
Femora bright reddish; antennæ very long **femur-rubrum**

10. Face-markings of female yellow; abdominal bands deep yellow; punctures of clypeus close together; vertex without yellow spots **finitima.**
Face-markings of female white or yellowish-white; abdominal bands light yellow 11.

11. Vertex with two yellow spots; clypeus broadly bordered with black anteriorly. **chilopsidis,** ♀.
Vertex without such spots; black border of clypeus much shorter 12.

12. Face broad, facial quadrangle broader than long **convergens,** ♀.
Face narrow, facial quadrangle much longer than broad; punctures of clypeus rather sparse **acanthophila.**

13. Postscutellum black; enclosure of metathorax smooth; clypeal space (space between clypeus and insertion of mandible) black **eriogoni.**
Postscutellum yellow or whitish 14.

14. Female with anterior margin of clypeus concave 15.
Female with anterior margin of clypeus entire or straight 16

15. The margin deeply concave, face-marks white **nigrescens.**
The margin slightly concave, face-marks yellow **novomexicana.**

16. Clypeus broadly truncate; stigma piceous **rinconis.**
Clypeus narrowly truncate or rounded; stigma ferruginous **vicinoides.**

In addition to the species now studied, the following have been found in New Mexico:

C. frontata Say. Vega S. José (Townsend), Roswell (Cockerell).

C. venator Cr. El Rito (Townsend), Las Vegas (Cockerell), Mesilla Valley.

C. bicornuta Guér. Vega S. José (Townsend). The last two are probably sexes of one species.

The species of *Cerceris* may be divided into rather artificial groups, according to the sculpture of the metathoracic enclosure. The differences in this structure are interesting, as it is difficult to imagine in what way they can be of service.

(*A.*) Enclosure without distinct punctures or striæ.

(*a*) Smooth and shining: *C. ferruginior, garciana, populorum, eriogoni, guara, venator, californica, kennicottii, tolteca, azteca.*

(*b*) Dull, slightly inclined to be striolate: *ricina*, *novomexicana*.
(*c*) Rugose: *blakei*.
(*d*) Obscurely aciculate (like *b*?): *binodis*.
(*e*) Aciculate: *maximiliani*, *montivaga*, *truncata*. In the last the median furrow is crenulated, as also it is in *flavida*.

(*B*.) Enclosure with punctures and striæ only at the sides.

(*a*) Smooth in middle, punctured at sides: *macrosticta*, *femur-rubrum*, *hebes*, *fasciola*.
(*b*) Dull, with a few rather large lateral punctures: *fidelis*, *subpetiolata*.
(*c*) Smooth, dullish, obliquely striatulate at sides: *convergens*, *rinconis*, *deserta*.
(*d*) Dull, margins punctate: *chilopsidis*.
(*e*) A few deep punctures on each side: *compar*.
(*f*) Shining, with slightly oblique striæ on sides: *sexta*.
(*g*) Shining, impunctate, the sides foveolate: *chiriquensis*.
(*h*) Impunctate, sides foveolate-striate: *imperialis*.
(*i*) Longitudinally striated laterally: *erythropoda*.

(*C*.) Striate or grooved practically all over.

(*a*) Strongly longitudinally striated: *nasica*, *platyrhina*, *imitator*, *morata*, *biungulata*, *nigrescens*, *dentifrons*, *strigosa*, *marginata*.
(*b*) Dull, granular, obliquely longitudinally striated: *tepaneca*.
(*c*) Finely and somewhat obliquely striated: *fulvipes*.
(*d*) Coarsely and obliquely striated: *compacta*.
(*e*) Shining, coarsely striolate: *aureofacialis*.
(*f*) Transversely striated: *smithiana*, *rufinoda*, *crotonella*.

(*D*.) Punctate practically all over.

(*a*) Punctured: *sonorensis*.
(*b*) Finely and closely punctured: *montezuma*.
(*c*) Ill-defined, strongly punctured: *feralis*.
(*d*) Not defined, except by six large oblong foveæ: *obsoleta*.

(*E*.) With the anterior and posterior portions different.

(*a*) Punctured, smooth at base: *jucunda*.
(*b*) Transversely striate anteriorly: *cockerelli*.
(*c*) Striate longitudinally or slightly obliquely at base: *clypeata*.

Cerceris nasica, new species.

♀. Length about 14½ mm.; black, dull yellow, and ferruginous; pubescence short and erect, rather abundant, distinctly golden on head and thorax; punctures throughout dense and coarse. Head with broad cheeks and vertex; facial quadrangle approximately square; clypeus with a very large projecting process, strongly convex above in a transverse direction, with the anterior corners (forming somewhat less than right angles) directed downwards; clypeus yellow, with the anterior margin of the process, and a shining concave area on the middle of the anterior margin (beneath the process), ferruginous; mandible yellow, with the apical two fifths black, the junction of the two colors ferruginous; lateral face-marks yellow and very broad, touching antennal sockets and ending in ferruginous wedge-shaped marks at the top of the eyes; yellow supraclypeal mark triangular, sending a process up each side of the sharp carina between the antennæ; front black, red between the ocelli; vertex and cheeks red, the latter with a yellowish spot on the upper part; flagellum red, with about the apical half, except the tip, black; thorax black, the coarse punctures often confluent; upper boarder of prothorax broadly yellow suffused with red; tubercles black, with a faint reddish spot; scutellum red; postscutellum yellow; enclosure of metathorax triangular and well-defined, strongly longitudinally ridged; tegulæ deep yellow, shining; wings fuliginous, stigma ferruginous, nervures mostly fuscous; legs yellow, strongly suffused with ferruginous, coxæ partly black; abdomen with the nodose first segment red, the others yellow, with a black band at the extreme base of the second to fifth; pygidial area parallel-sided, transversely corrugated, ferruginous with the tip black.

Habitat. — New Mexico (F. H. Snow). Exact locality and date unknown.

Cerceris fidelis, new species.

♀. Length about 18 mm.; similar to *C. nasica*, but easily distinguished by the clypeal process being comparatively very short; the enclosure of metathorax without longitudinal ridges, but with a slight median groove, and an oblique row of punctures on each side; and the sides of the metathorax almost entirely yellow, the yellow suffused with red along the edges. Other differences are as follows; size larger; anterior middle of clypeus with a transverse blackish groove instead of a shining area; no red between ocelli; yellow of lateral face marks extending up on to vertex; mesothorax slightly marked with red posteriorly; tegulæ red with a suffused yellow mark; wings not so dark except on apical margins; basal nervure falling considerably short of transverse medial (in *nasica* it nearly meets it); femora red, hind femora yellow in front; first abdominal segment yellow like the rest; ventral surface of abdomen mainly red; pygidial area evenly rugose, with a strong fringe of pale golden hairs on each side. The flagellum is longer in *fidelis* than in *nasica*, and only red basally.

Habitat. — Santa Fé, N. M. (Cockerell, 1336). Taken July 7. Mr. Fox had recognized it years ago (in litt.) as an apparently new species, near *C. inimica*.

Cerceris platyrhina, new species.

♀. Length about 11 mm.; allied to *nasica*, and like it having the enclosure of metathorax strongly longitudinally ridged. It differs as follows: smaller and rather more slender; much less hairy; clypeal process flatter, and less emarginate seen from above; clypeus beneath process black, bordered on margin with some dark reddish, the shining concave area as in *nasica;* supraclypeal mark small, narrow and red, only occupying the lower part of the interantennal carina; yellow lateral face-marks ending abruptly no great distance above level of antennæ; front, cheeks, vertex and occiput black, except a small red spot behind ocelli; and a large red spot behind the upper part of each eye; no yellow on the red of prothorax; metathorax black, with a minute reddish spot on each side, scarcely visible; tegulæ yellowish-ferruginous; third abdominal segment with a red median cloud. As in *nasica* (but not in *fidelis*) the basal nervure almost meets transverse medial, and the first abdominal segment (except its black base) is red.

Habitat. — Fillmore Cañon, Organ Mts., N. M., August 29 (Cockerell).

Cerceris macrosticta, new species.

♂. Length about 13½ mm.; black, yellow and red; not conspicuously hairy; densely and coarsely punctured, the punctures especially large on the metathorax and abdomen. Eyes large; facial quadrangle much longer than broad; face yellow up to level of antennæ, except a small black triangle beneath each socket, sending a narrow stripe down to the margin of the clypeus; vertex and front black, except that the lateral face-marks go a short distance above the level of the antennæ; posterior orbits bounded by a yellow stripe which ends abruptly not far from the top of the eye, sending a short process backward; cheeks behind the stripe slightly reddish, but the red soon passes into black; antennæ with the first five joints ferruginous, the next dusky reddish, the color beyond rapidly passing into dull black on the upper side, while the joints on the under side are shining yellowish, except the apical part of the last, which is black beneath, as well as above; on the upper side, the apical margins of the joints are inclined to be narrowly pallid, and are very conspicuously so on joints 11 and 12; joint 11 is longer than 10; 12 is much longer, being about as long as 10 and 11 together; 13 is somewhat shorter than 12, and obliquely truncate; mandibles yellow with the apex broadly black; anterior margin of clypeus obtusely pointed or angled in the middle, and from beneath each side, occupying the lateral third of the margin, there projects a reddish fringe of united hairs, concave on the upper side (a similar structure occurs in *C. hebes* Cam., Biol. Cent. Am., Hym. II, Pl. 8, fig. 4*b*); thorax black, the upper border of prothorax extending to tubercles, but interrupted in the middle line, round spot behind tubercles, oblong mark (slightly bordered with red) on pleura below that, spot on each side of scutellum (the area between these spots red), postscutellum, shining elongate mark on metathoracic enclosure (which is otherwise completely punctate), and large elongate marks on sides of metathorax, all yellow; tegulæ shining yellow; wings strongly ferruginous, nervures ferruginous; compared with *C. nasica* the marginal cell is longer, and the second submarginal much smaller, with a longer superior petiole; legs yellow and red, the tarsi light yellow, the femora with blackish stripes above; anterior femora, and to a less degree the

middle ones, swollen beneath, the swollen surface being shining and yellow; posterior femora ferruginous beneath, with two dark longitudinal stripes; hind tibiæ somewhat contorted, with a subhyaline saw-toothed posterior edge; joints of hind tarsi stout; abdomen constricted between the segments, with a peculiar appearance from the very large punctures; general color yellow, black at the sutures and on disc of first segment, broadly red on discs of second to fifth segments, the red bounded behind by yellow; apex broadly truncate, the sides of the truncation somewhat pointed, and the margin wavy with a double curve; ventral surface yellow with three broad black bands, and a pair of brown club-shaped marks, joined basally, on first segment, the surface of the segments also thinly covered with long appressed hairs.

Habitat.—"New Mexico"; no other particulars known. In Coll. Acad. Nat. Sci., Phila.

Cerceris ferruginior, new species.

♂. Length 9 mm.; black, yellow and red; strongly punctured, the punctures on the front very close, on the mesothorax large and well separated on a shining ground, on the abdomen quite close. Face light yellow, nearly up to level of anterior ocellus, vertex and occiput black, the black extending downwards as a tongue to the base of each antennæ; cheeks black, with a triangular yellow mark on the lower part; mandibles yellow at base, ferruginous in the middle, and black at the end; clypeus ordinary; a little brush of stiff yellowish hair overlapping the base of each mandible; scape curved and slightly swollen, yellow in front, ferruginous behind; flagellum with the base ferruginous, passing into black above, the extreme apex red; prothorax with the whole of the upper part broadly yellow, with a dark ferruginous stain in the middle, tubercles yellowish-ferruginous; pleura ferruginous, suffused with black along the margins, and with a yellow patch just behind the tubercles; mesothorax black; tegulæ lemon-yellow; scutellum yellowish-ferruginous, edged with black in front and behind; postscutellum yellow; metathorax with the enclosure and a stripe passing downwards from it, black; the enclosure very distinct, smooth, impunctate, triangular; sides of metathorax ferruginous suffused with yellow, strongly but rather sparsely punctured; wings nearly clear, with the marginal and submarginal cells, and especially the apex, clouded with black; stigma orange-ferruginous nervures fuscous first recurrent nervure joining second submarginal cell about one third of its length from the base, legs ferruginous, tibiæ and basal joint of tarsi mostly yellow; hind tibæ with a large blackish apical blotch behind; small joints of hind tarsi fuscous; hind coxæ with a rounded apical lamina; abdomen stongly constricted at the sutures laterally; first segment narrow, suboval, less than half the width of the second, ferruginous; second to sixth yellow, second with a large ferruginous basal patch, third to fifth largely black at base; apical plate ferruginous, truncate; venter with the first two segments red, the second with large sparse punctures, the other segments banded with black and light yellow, the yellow stained with ferruginous in the middle.

Habitat.—Southern New Mexico (Cockerell, B 46). The type was collected at Deming, in July.

Cerceris garciana, new species.

♂. Length about 9 mm.; similar to *C. ferruginior*, but differs as follows: yellow of prothorax interrupted in the middle by a black line; tubercles black edged with light; pleura black; scutellum black with a faint reddish spot on each side; metathorax black, with an oval yellow patch edged with reddish, on each side; first two abdominal segments black at base; first segment decidedly shorter, and broader in proportion to its length; nervures ferruginous, second submarginal cell broader; second ventral abdominal segment with much black.

Habitat. — Las Cruces, N. M., May 18 (Fabian Garcia). This may represent only a race of the last.

Cerceris populorum, new species.

♂. Length about 10½ mm.; allied to the last two, and having, like them, the metathoracic enclosure smooth and shining. The general structure and punctuation is also the same. Head black, with the face light yellow except the anterior margin of the clypeus broadly and a large wedge-shaped mark on each side, which are black; mandibles ferruginous; scape dark ferruginous with a small light yellow spot; flagellum mostly black or nearly so, ferruginous beneath at base, and sometimes above on first two joints, and the extreme apex red; thorax black, upper border of prothorax broadly yellow, interrupted by black in the middle; a reddish dot on tubercles, and another just behind, or the latter may be absent; scutellum and metathorax black, but postscutellum yellow; tegulæ yellow; wings as in *C. ferruginior*, except that the second submarginal cell is larger, and the third transverse-cubital nervure has a distinct double curve; legs red, tibiæ yellow, tarsi dusky ferruginous, anterior femora with a large black patch behind, middle femora with a small one; posterior tibiæ with an apical blackish patch behind; first abdominal segment shaped about as in *garciana*, red, with an anterior black patch; segments 2 to 6 yellow, broadly black at base, the black on 2 to 4 much best developed in the middle; apical plate dark ferruginous, truncate, the angles spined; venter black suffused with red, without yellow bands.

Habitat. — Albuquerque, N. M., June 30, between the town and the University (Cockerell, 3215 = type). Another (Cockerell, 2951) May 8, on a young poplar tree, not in flower, on campus of Agricultural College at Mesilla Park, N. M. On the same poplar tree, at the same time, were taken *Perilampus hyalinus*, ♀, *Monodontomerus montivagus*, ♂ (both det. Ashm.) and a male *Colletes*.

Cerceris femur-rubrum, new species.

♂. Length about 9 mm.; black marked with cream-color or very light yellow, no red marks on body; legs red and cream-color; surface of body shining, with dense strong punctures. Head black, a small yellowish spot behind the top of each eye; face up to level of antennæ cream-color, this color further extending upwards as a narrow band in the middle line, and broadly at the sides, terminating a short distance below the level of the middle ocellus; mandibles whitish basally, ferruginous in the middle, and black at apex; middle of anterior margin of clypeus pointed; lateral

fringes long, concave above, hyaline; antennæ very long; scape yellowish in front, pale red behind; flagellum red at base and beneath, but passing into reddish-black above, the apical joint red and curved; thorax black, the upper border of prothorax broadly, but interrupted in the middle, a spot behind tubercles, two large patches (with only a linear separation) on scutellum, a short stripe on postscutellum, and an elongate mark on each side of metathorax, all cream-color; enclosure of metathorax smooth in the middle and punctured at the sides; tegulæ cream-color, dark reddish basally; wings with the usual dusky apex, stigma ferruginous, nervures fuscous; coxæ cream-colored in front, as also are the middle and hind trochanters; femora very bright light ferruginous, the anterior and middle ones with a cream-colored patch beneath; anterior and middle tibiæ cream-color, more or less reddish on inner side; hind tibiæ somewhat distorted, cream-color basally, otherwise red; tarsi cream-color and reddish, claw-joint of hind tarsi blackish at base; abdomen with the first segment rather broader than long, with long erect pale hairs; segments 1 to 6 black, with a broad light yellow band; apical plate very broad, black with the hind edge rather broadly red; venter extremely dark reddish-brown, with four cream-colored spots on each side.

Habitat. — Albuquerque, N. M., June 30, between the town and the university two specimens (Cockerell, 3236 and 3237). The antennæ are much longer than in *C. garciana*, etc.

Cerceris convergens, new species.

♀. Length about 8 mm.; black with creamy-white to very light yellow markings, the yellowest tint being on the broad band on second abdominal segment; punctures strong and dense; pubescence very scanty. Head large, transversely oval, facial quadrangle somewhat broader than long; clypeus, a supraclypeal dot, and broad lateral marks going a short distance above the antennæ, cream color; vertex dullish and very densely punctured; anterior edge of clypeus somewhat projecting, and black, the lateral fringes silvery white; mandibles with the basal half mainly cream-colored; antennæ of ordinary length; scape curved, white in front; flagellum yellowish beneath and blackish above; thorax rather dull black, two transverse marks on upper border of prothorax, spot behind tubules, a spot on each side of scutellum, and postscutellum, cream-color; enclosure of metathorax smooth with its marginal area transversely (obliquely) striatulate; tegulæ cream-color with hyaline spot and margin; wings hyaline, apex and marginal cell blackened; stigma piceous, nervures dark brown; coxæ, trochanters and femora black the latter with the apices cream-color, the truncation of hind femora red; tibiæ cream-color, the anterior and middle ones with a black patch behind, the hind ones with the apical two fifths black; anterior and middle tarsi pale, hind tarsi blackish; first abdominal segment broader than long, bulging laterally, black with a dorsal cream-colored patch; second to fifth segments black with a light yellow band, that on second the broadest; pygideal area dark, narrow-pyriform, constricted apically; venter black without markings.

Habitat. — Alamogordo, N. M., May 13, 1902, one ♀ (H. L. Viereck).

Cerceris chilopsidis, new species.

♀. Length nearly 9 mm.; similar to *C. convergens* but larger and presenting the following differences in detail: black clypeal margin much broader; supraclypeal

mark triangular; a pair of obliquely placed elongate light yellow marks on vertex; light spots on scutellum larger and much closer together; apical half of hind tibiæ dark; yellow band on second abdominal segment much narrower in the middle than at the sides; pygidial plate broadly rounded, not constricted at the end. Several of these characters are no doubt variable, but the different pygidial plate is quite distinctive. As in *C. convergens* the stigma is piceous, and there is brilliant silvery pubescence on each side of the clypeus.

Habitat. — Southern New Mexico (Cockerell, B 4). The type was collected at Rincon, July 5, at flowers of *Chilopsis saligna*.

The enclosure of the metathorax in *C. convergens* and *chilopsidis* is smooth and dullish, with the usual median furrow; in *convergens* its lateral margins are delicately striate, but in *chilopsidis* they are punctate, and the lower end of the furrow has some minute transverse ridges.

Cerceris rinconis, new species.

♀. Size and appearance of *C. chilopsidis*, but differs as follows: black clypeal margin much shorter (more as in *convergens*); no supraclypeal mark; no mark on vertex; scutellum entirely black; enclosure of metathorax dullish, its margin faintly striatulate, not punctate; apices of femora more or less reddish; spot on first abdominal segment very small; pygidial plate narrowed apically. The stigma is piceous, and the hair on each side of clypeus silvery.

Habitat. — Southern New Mexico (Cockerell, B 4). The type was collected at Rincon, July 5, at flowers of *Chilopsis saligna*.

C. rinconis is certainly distinct from *C. chilopsidis*, but it will very likely prove to be only a variety of *C. convergens*.

Cerceris novomexicana, new species.

♀. Looks like *vicina*, but rather larger, and differs as follows: clypeus with the anterior margin broadly truncate and gently concave, after the general style of *C. nigrescens;* scape stouter, bright yellow in front; a large yellow spot on each side of metathorax; pygidial plate subtruncate at end; anterior and middle femora with more than the apical half bright yellow. The stigma is ferruginous, and there is no patch of silvery hair on each side of the clypeus. The markings are very bright yellow. The anterior and middle tibiæ are entirely yellow. The enclosure of metathorax, as in *vicina*, is dull, without punctures or grooves but slightly longitudinally striate.

Habitat. — Johnson Park, N. M., at skunk-cabbage, July 7, 1903 (Anna Gohrman, No. 5). It is a little doubtful what plant is referred to as "skunk-cabbage."

This has many characters in common with *C. deserta*, Say, but differs by the large yellow marks on metathorax, the character of the punctuation, etc.

Cerceris nigrescens Smith.

♀. Highrolls, N. M., May 29 and 30, 1902 (Viereck); Beulah, N. M., June 29, 1902 (Viereck), and Aug., 1902 (Cockerell); Pecos, N. M., at flowers of *Fallugia*, June 23, 1903 (W. P. Cockerell). The Pecos specimen represents a variation with large yellowish-white lateral marks on the third and fourth ventral segments of abdomen. One of the Beulah specimens has small lateral dots on these segments; the others have the venter entirely black. The enclosure of the metathorax is distinctly longitudinally (a little obliquely) striated. Three males, which evidently belong here, are from Highrolls, N. M., May 29, 1902 (Viereck), and Las Vegas, N. M., at flowers of *Solidago canadensis*, Aug. 11 (W. P. Cockerell). They have the face light yellow instead of white; the metathorax varies from all black to spotted with yellow. *C. nigrescens*, in New Mexico, inhabits the Upper Austral, Transition and Canadian zones.

Cerceris acanthophila Cockerell.

Described in *Entomologist*, 1897, p. 135. It inhabits the Middle and Upper Austral zones in New Mexico, having been collected at Deming (Cockerell), Las Cruces (Cockerell), Las Vegas (Viereck, W. P. Cockerell) and White Oaks (B. Chapman). One comes from Las Vegas Hot Springs (Cockerell), just in the Transition Zone. It has been observed to visit *Solanum elæagnifolium* at Las Cruces, *Pctalostemon oligophyllus* at Las Vegas. The time of flight appears to be the same as that of *C. nigrescens*. The stigma is piceous varying to brown, never fulvous or ferruginous; in *nigrescens* it is fulvo-ferruginous. The enclosure of the metathorax is smooth and shining, but in the females it shows some very distinct marginal punctures.

Cerceris finitima Cresson.

Mesilla, N. M., at *Solidago canadensis*, August 15 (Cockerell); Las Cruces, N. M. (Cockerell); Highrolls, N. M., June 14, 1902 (Viereck). The stigma is dark brown or piceous; the enclosure of metathorax is more or less transversely striate.

Cerceris rufinoda Cresson.

Las Vegas, N. M., 4 ♂, 1 ♀, June 26, 1902 (Viereck). The enclosure of metathorax is coarsely transversely ridged. In the ♀ the clypeus and face on each side of it are black, and the large oblong lateral face marks, on each side of the antennæ, are very pale yellow; the pygidial plate is broadly truncate.

Cerceris rufinoda var. crucis, new variety.

♀. Lateral face-marks white; clypeus, etc., black as in type; metathorax, except enclosure, red (black in type); pygidial plate as in type.

Habitat. — Las Cruces, N. M., at staminate flowers of *Croton neomexicanum*, September 25, 1895 (Cockerell); also one with the second abdominal segment (as well as the first) red, Las Cruces, August 24 (Cockerell).

Cerceris crotonella, new species.

♀. Like *C. rufinoda* var. *crucis*, but smaller (length hardly over 6 mm.), with the clypeus and face on each side of it white, and a linear white supraclypeal band reaching nearly to anterior ocellus; metathorax (except enclosure) and first three segments of abdomen red, except for the usual yellowish-white bands; stigma brown; second submarginal cell much smaller, the petiole being about as long as one of the sides; pygidial plate with the end rounded, and narrower; venter with the first three segments red, the others black, without markings.

Habitat. — Las Cruces, N. M., at staminate flowers of *Croton neomexicanum*, September 25, 1895, one (Cockerell). The coloration of the face recalls the male of *rufinoda*.

Cerceris eriogoni, new species.

♂. 6.5 mm. Head: Black, with the clypeus except the lower border and lateral face marks yellow; lateral face marks not extending to the antennæ nor to the mandibles but near to the top of the eye; deeply punctured the punctures adjoining or nearly; a distinct longitudinal carina between the antennæ extending shortly above and below their insertion; eyes dark somewhat brownish; joint 3 of the antenna longer than 4, shorter than 4 + 5; scape orange, flagellum reddish-orange beneath, dark-brown above, mandibles yellow and brown.

Pronotum slightly depressed medially, the anterior border moderately ridged; punctured but not distinctly; traversed by a broken yellow band; propleura black, presenting a groove bounded by ridges, dorsulum with punctures more separated than those on the head but equally as deep, somewhat shining, tegulæ yellow; mesopleura dull with deep adjoining punctures; scutellum punctured more like the pronotum than the dorsulum. yellow; postscutellum black, its punctures five and adjoining; metathorax shining, punctured like the head, the punctures adjoining, enclosure clearly defined, smooth, with a shallow longitudinal impression which is slightly transversely striate; wings: first and second recurrent nervures entering the second and third cubital cells respectively as far from the cubitus as the petiole of the second submarginal cell is long, nervures and stigma dark-brown, median cell in the costal corner, marginal cell and apex of wing fuscous; legs black, apices of femora, four anterior tibiæ and tarsi, basal two thirds of posterior tibiæ and metatarsi of posterior legs yellow, tarsi brown.

Abdomen: Dorsally uniformly punctured like the metathorax, venter indistinctly punctured; pygidium moderately margined about one and a half times as long as broad, second segment with the apical half orange, segments 3, 4 and 5 with apical

third 6 with apical half orange. Entire insect covered with silver pubescence which does not obscure the sculpture and is most abundant on the pleura, dense and appressed on the yellow space of the face.

Habitat. — Dripping Springs, Organ Mts., New Mexico at flowers of *Eriogonum* (Cockerell). Related to *C. kennicottii.*

Cerceris townsendi, new species.

♀. 7 mm. Head: Black, a yellow spot behind each eye near the vertex, all of the face below antennæ yellow, the lateral face marks and the supraclypeal mark extending half way between the antennæ and anterior ocellus; strongly punctured, the punctures adjoining on the front and vertex, punctures on the yellow lateral face marks not adjoining and not so deep, frontal carina terminating above with the supraclypeal mark, below extending nearly to the clypeus, eyes dull gray; relation of antennal joints same as in *eriogoni*, scape yellow, pedicellum and flagellum pale brown beneath, dark brown above; mandibles yellow tipped with brown.

Thorax: Pronotum feebly margined on the sides, with large shallow separated punctures and a transverse yellow band interrupted with black; propleura black not grooved; dorsulum with punctures like those on the head adjoining separated in the middle; mesopleura with shallow adjoining punctures giving a reticulated appearance; scutellum punctured like the dorsulum, in the middle with sparse punctures; metathorax coarsely punctured like the dorsulum, shining, enclosure dull, appearing transversely striate, black, with two yellow spots one on each side; wings, first and second, recurrent nervures entering the second and third submarginal cells respectively a little farther from the first and second transverse cubiti than the length of the petiole of the second submarginal cell, stigma testaceous, nervures brown, marginal cell and apex of the wings infuscated; legs yellow, basal half of four anterior femora and apical half of posterior femora more or less brown to black, posterior tibiæ posteriorly and tarsi brownish.

Abdomen: Uniformly punctured but not so coarsely as the metathorax, the venter indistinctly punctured except on the raised portions where the punctures are almost as distinct as on the dorsulum, pygidium as in *eriogonum*, first segment with two spots, one on each side, segments 2, 3, 4, 5 and 6 with an apical yellow band occupying ⅓ or more of the segment, ventral segments 2, 3 and 4 with a yellow spot on each side.

Everywhere thinly pubescent with silvery hair.

Habitat. — Las Cruces, New Mexico (Townsend).

Cerceris vicinoides, new species.

♂. 9.5 mm. Head: Black, a yellow spot on each cheek near the vertex; clypeus protuberant, truncate, yellow, margined with black; a yellow spot on each side of the face below the lateral face marks, the latter separated from the clypeus by a black line and nearly extending to the top of the eye; supraclypeal mark represented by two yellow spots; face and clypeus dull the punctures shallow; head with nearly adjoining well defined shallow punctures; eyes black and gray; third joint of antennæ equal to 4 + 5, scape black yellow in front, pedicellum and flagellum dark brown above pale brown beneath; basal half of mandibles yellow, apical half nearly black.

Thorax: Pronotum not distinctly punctured nor margined, slightly impressed medially, a yellow spot on each side; propleura black, slightly grooved and striate; dorsulum dull, punctures irregularly spaced some adjoining others more than twice their width apart, lateral impressed lines indicated; mesopleura dull reticulate; scutellum punctured much like dorsulum; postscutellum almost impunctate banded with yellow; metathorax punctured like the dorsulum, enclosure dull impunctate, with an indistinct median groove, a yellow spot on each side; wings as in *eriogoni*, greater part of tegulæ yellow, stigma pale brown, nervures brown, marginal cell and apex of wing smoky; legs black, apices of four anterior femora with some yellow, tibiæ and tarsi of four anterior legs yellow, the tarsi becoming brownish, posterior tibiæ yellow, apical third black, tarsi brownish.

Abdomen: Uniformly punctured, the punctures nearly adjoining, raised portions of ventral segments nearly as distinctly punctured as the dorsum; pygidium twice as long as broad at base, finger shaped; first segment with a yellow spot on each side, segments 2, 3, 4 and 5 with an apical yellow band, broad laterally, narrow in the middle; ventral segments 3 and 4 with a yellow spot on each side.

Pubescent like *townsendi*.

Habitat. — Pecos, New Mexico, June 25, 1903, on *Fallugia* (W. P. Cockerell).

Genus APHILANTHOPS Patton.

TABLE OF SPECIES.

Female. Reddish, markings yellow; black or blackish band from eye to eye on the vertex, enclosing ocelli **concinnulus.**

Males. Black predominating, markings yellow, reddish hue confined to legs and abdomen, sometimes the thorax is partly reddish **concinnulus.**

Abdomen not reddish, black and yellow.

Face all black **taurulus.**

Face with prominent yellow marks.

Punctures on front between ocelli and eyes separated, rather distinct; flagellum all black **frigidus.**

Punctures on front between ocelli and eyes rather indistinct; flagellum partly brown **bakeri.**

Aphilanthops concinnulus Cockerell.

Rincon, N. M., both sexes (Cockerell); Las Cruces, on *Solanum* (Cockerell, 898). Dunning has erroneously referred the female to *A. utahensis* Baker.

Aphilanthops taurulus Cockerell.

Las Cruces, N. M., male at staminate flowers of *Croton neomexicanum*, September 25, 1895 (Cockerell). Las Cruces (Cockerell, 5090). Also found at Rincon.

Aphilanthops frigidis (Smith).

Highrolls, N. M., May 29, 1902 (Viereck).

Aphilanthops bakeri Dunning.

"New Mexico"; one in Coll. Amer. Ent. Soc.

Aphilanthops quadrinotatus Ashmead.

Mesilla Valley (Cockerell); Glorieta, 1903 (Cockerell).

Aphilanthops laticinctus (Cress).

Mesilla Valley (Cockerell); Santa Fé (Cockerell).

Genus PHILANTHUS Fabricius.

As here used, this generic name includes *Anthophilus* and *Pseudanthophilus*.

TABLE OF SPECIES.

Females and males.

Predominating color of abdomen yellow (at least in one sex)..... 1.

Predominating color of abdomen black..... 3.

1. Very large, about 18 mm. long **gloriosus.**

Smaller 14 mm. long and less 2.

2. First abdominal segment with red **basilaris.**

First abdominal segment with no red.

Head behind the eye marked with yellow; head and thorax not distinctly hairy; first abdominal segment coarsely punctured.

First segment of abdomen impunctate or nearly where the anterior face joins the superior face..... **crabroniformis.**

First abdominal segment finely punctured where the anterior face joins the superior face..... **crotoniphilus.**

Head behind the eye without a yellow spot, all black.

Head and thorax distinctly hairy; first abdominal segment finely punctured..... **albopilosus.**

Head and thorax not distinctly hairy; first abdominal segment coarsely punctured **punctinudus.**

3. Segments of abdomen very coarsely punctured **cockerelli.**

Segments of abdomen at least in part rather moderately punctured; abdomen with sinuate or broken bands.

Females.

Clypeus with a rounded out truncation and a blunt tooth each side thereof.. **psyche.**

Clypeus simple **politus.**

Males.

Two series of punctures on third dorsal segment..... 4.

One series of small or moderate punctures on third dorsal segment.. 5.

4. Punctures rather dense..... **albifrons.**

Punctures rather sparse..... **albifrons.**

5. Front with a large yellow spot and a large black space between it and the eyes. **pulchellus.**

Front with the yellow space larger, extending to the eyes and connected with the yellow below..... **pacificus.**

Philanthus gloriosus Cresson.

Pecos, N. M., August 19, 1903, at flowers of *Eriogonum*, one (W. P. Cockerell); Pecos, August 6, 1903 (Cockerell); White Oaks, August 2, 1902 (Bertha Chapman). Also Mesilla Valley. The eyes of the female in life are dull green suffused with reddish.

Philanthus basilaris Cresson.

Pecos, N. M., August 19, 1903, at flowers of *Eriogonum*, one of each sex (W. P. Cockerell), and one male (T. D. A. Cockerell). The male frequently settles upon the ground, and looks rather like a Bembecid; it has the eyes pea-green in life, strongly converging above, and antennæ recall those of ♂ *Masaris*.*

Philanthus crabroniformis Smith (*multimaculatus* Cam.).

Las Cruces, N. M., at *Salix*, May 2, ♂ = type of *P. anna* Dunning (Cockerell); Las Cruces, at *Bigelovia, i. e., Isocoma*, one = cotype of *P. cleomæ* Dunning (Cockerell, 4786); Las Cruces, at *Chilopsis saligna* in Barker's garden, June 5 (Cockerell); Mesilla, at *Aster spinosus*, June 24 (Cockerell); Highrolls, May 30 to June 3, 1902, three (Viereck); Santa Fé, August, at *Cleome serrulata*, one (Cockerell, 4092). Ranges from the Middle Sonoran to the Transition Zone.

Philanthus albopilosus Cresson.

Las Cruces, N. M., at *Solidago*, one (Cockerell, 2000).

Philanthus cockerelli (**Dunning**).

Described as a variety of *punctatus*, but apparently a valid species.

Rincon, N. M. (Cockerell, B4); Las Cruces (Cockerell, 1954); Highrolls, May 30 to June 3, 1902 (Viereck); Alamogordo, May 9 to 13, 1902, two (Viereck). Also Fillmore Cañon, Organ Mts. (C. H. T. Townsend).

P. punctatus Say, reported from the Mesilla Valley, was no doubt *cockerelli*.

Philanthus psyche Dunning.

Las Cruces, N. M. (Cockerell, 4893).

Philanthus politus Say.

Pecos Cañon, N. M., 7200 feet, at flowers of *Holodiscus australis*, July 21, 1903 (W. P. Cockerell); near Viveash Ranch (above Pecos,

* It is worth while to record that *Pseudomasaris vespoides* (Cress.) was common at Pecos, and its habits were studied by Mrs. Cockerell.

Cañon), 8800 feet, at flowers of *Potentilla*, July 21, 1903 (W. P. Cockerell).

Philanthus albifrons Cresson (*henricus* Dunning).

Beulah, N. M., August 16, 1900 (T. D. A. and W. P. Cockerell); Pecos, July 25 to August 18, 1903 (Cockerell); Las Vegas Hot Springs, a more sparsely punctured form (Cockerell). Also on the Gila River in New Mexico (C. H. T. Townsend).

Philanthus pulchellus Cresson.

Pecos, at *Fallugia*, June 23 and 24, 1903 (W. P. Cockerell); Beulah, June 29, 1902 (Viereck).

The markings of the abdomen are variable.

Philanthus pacificus Cresson.

Las Cruces, at staminate flowers of *Croton neomexicanum*, September 25, 1895 (Cockerell).

Philanthus scelestus Cresson.

Santa Fé (see Canadian Entomologist, 1898, p. 152).

Philanthus ventilabris Fabricius.

Socorro (Cockerell, 3168), var. *frontalis*, Cresson, Mesilla Valley (Cockerell), Gila River (Townsend), Las Vegas (Cockerell).

Philanthus punctinudus, new species.

♂. 6.5 mm. Head: yellow with the vertex, occiput, cheeks, a very narrow margin along the inner orbits, a spot back of the insertion of antennæ, mandibles and antennæ black; two yellow spots back of posterior ocelli; eyes dull brownish, almost impunctate, except on vertex where the punctures are distinct but sparse; a distinct median longitudinal impressed line between the antennæ, not extending to the clypeus; third joint of antennæ longer than 4 + 5, shorter than 4 + 5 + 6; hardly any molar space.

Thorax: Pronotum slightly notched in the middle, with some obscure punctures, yellow; dorsulum polished, sparsely punctured, slightly impressed in the middle, two yellow streaks along the middle line and a yellow spot above each tegula; mesopleura almost reticulate with a yellow spot adjoining the yellow tubercles; scutellum and postscutellum yellow with a slight median impressed line, sparsely punctured like the dorsulum; metathorax shining black with two yellow spots on the superior disc which is impressed medially, the impression rugulose, otherwise the surface of the metathorax is interrupted by sparse, shallow punctures, sparsest on the superior face; tegulæ and base of wings yellow, transverse median nervure almost interstitial with the basal, first recurrent nervure received by the second submarginal cell before the middle, second recurrent nervure received by the third submarginal cell before the basal fourth, stigma and costal nervure pale testaceous, the other nervures darker, rather fuscous; femora brownish to blackish, except the yellow tips, trochanters and

coxæ brownish to black, tibiæ yellow, a brown stripe on the under side, tarsi yellow, the apical joints brownish like the claws, pulvilli blackish.

Abdomen : Segments 1 and 2 more closely punctured than the dorsulum, yellow, except a basal black border which widens into a triangle laterally and an apical black border ; the remaining segments not so distinctly punctured as the first two ; segments 3, 4 and 5 with a sinuate, narrow yellow band on the apical margin ; apical segments black ; venter black.

Entire insect covered with a sparse silvery pubescence, the hairs longest on the head and metathorax.

Habitat. — San Marcial, New Mexico (Cockerell, 3118).

Philanthus crotoniphilus, new species.

♂. 9 mm. Head : front very closely punctured, dullish ; vertex rather sparsely punctured, shining ; cheeks finely rather closely punctured ; front with a median impressed line between the antennæ ; sides of the face more shining, not so closely punctured as the vertex ; clypeus indistinctly punctured ; front yellow except the black dot on each side of the clypeus, the black margin of the clypeus, the black around the insertion of the antennæ which is fused with a broad band of black on the front that connects with the black vertex and is united by a narrow band in front of the anterior ocellus, cheeks black with a yellow spot, mandibles yellow ; malar space longer than the pedicellum ; third joint of antennæ longer than 4 + 5, shorter than 4 + 5 + 6, antennæ entirely black, eyes greenish.

Thorax : Pronotum as in *punctinudus ;* dorsulum rather closely punctured except posteriorly where the punctures become sparse, a median impression more closely punctured than the adjoining area ; dorsulum black ; tegulæ, base of wings and tubercles yellow ; mesopleura polished, distinctly rather sparsely punctured and with a transverse median impressed line on the superior half where the punctures are closest ; scutellum punctured like mesopleura, black with a yellow spot on each side ; postscutellum not so distinctly punctured, yellow ; metathorax dullish, rather closely punctured, the median impression of the superior face rugulose, the median impression of the posterior face punctured like the adjoining area ; a yellow band on the metapleura bordering the posterior face ; tegulæ and base of wings yellowish, stigma and costa testaceous, nervures brownish ; transverse median nervure received basad of the basal, first recurrent nervure received by the second submarginal cell before the middle, second recurrent nervure received by the third submarginal cell before the basal fourth, stigma and nervures colored as in *punctinudus ;* coxæ and trochanters black except the yellow tips in some cases, femora black, the four anterior ones with nearly all of apical half yellow, the posterior two with apex yellow, tibiæ and tarsi yellow, the apical joints of the tarsi and the claws brownish, pulvilli blackish.

Abdomen : First and second segments coarsely punctured, the punctures nearly adjoining, in addition the first segment has fine punctures on the basal and apical margins ; first segment with a broad yellow band across the middle nearly interrupted medially ; second segment yellow with a narrow basal black band which is enlarged along the middle line and on the sides ; third segment with sparse, large, shallow punctures, all of apical half and a little more covered with a yellow band widest laterally ; segments 4–5 and 6 with a yellow band close to the apical margin, broadest

laterally; apex black; venter brownish and black, segments 2, 3 and 4 with a yellow spot on each side.

Covered with a pale whitish or silvery thin pubescence, quite abundant but nowhere hiding the surface, longest and most abundant on the head and venter.

Habitat. — Las Cruces, N. Mexico, 25 September, 1895, on staminate flowers of *Croton neomexicanum* (Cockerell).

DESCRIPTIONS OF NEW HYMENOPTERA FROM JAPAN. — II.

By WILLIAM H. ASHMEAD, M.A., D.Sc.

Washington, D. C.

(Plates VII and VIII.)

Family LXI, TORYMIDÆ.

Subfamily V, MEGASTIGMINÆ.

Genus MEGASTIGMUS Dalman.

Megastigmus japonicus, new species.

Female. — Length, 2.5–3 mm.; ovipositor two thirds the length of the abdomen. Uniformly brownish-yellow, the sclerite between the parapsides and the tegulæ with a black or dusky spot, the abdomen with some brownish stains towards base above, the sheaths of the ovipositor black; eyes brown; ocelli black; flagellum pale brownish, the scape, pedicel, and legs yellowish. Wings hyaline, the veins, except the stigmal vein and its large knob which are brown-black, yellowish. The pronotum and the mesonotum are very finely transversely wrinkled, the scutellum feebly punctate, with a medium impressed line anteriorly and a cross-furrow before apex.

Type. — No. 7149, U. S. National Museum.

Japan (exact locality not given). Mr. A. Koebele; Gifu, taken in October by Mr. Y. Nawa, labelled No. 68.

Described from ten specimens, eight taken by Mr. Koebele and two taken by Mr. Nawa.

Megastigmus koebelei, new species.

Female. — Length, 2.5 mm., ovipositor as long as the abdomen. Uniformly brownish-yellow, immaculate, the ocelli dark, the eyes brown, the sheaths of the ovipositor black, the flagellum light brown, the scape and the legs pale yellowish. The pronotum above and the lobes of the mesonotum are delicately transversely wrinkled. Wings hyaline, the veins light brown, the large rounded knob of the stigmal vein brown-black.

Type. — No. 7150, U. S. National Museum.

Atami. Described from a single specimen received from Mr. A. Koebele and labelled No. 1558, evidently bred.

Family LXII, CHALCIDIDÆ.

Subfamily I, LEUCOSPIDINÆ.

Genus LEUCOSPIS Fabricius.

Leuscospis japonica Walker.

A female and male of this species were received from Dr. Mitsukuri. The male was unknown to Walker; it differs from the female in having no yellow band at the apex of the scutellum, the two minute yellow spots on the disk of the pronotum, so conspicuous in the female are wanting, while the abdomen has two yellow bands — a band at the apex of the second and the third segments, two yellow dots on the disk of the first segment and a yellow dot at the apex of the last segment.

Type ♂ — No. 7151, U. S. National Museum.

Gifu. Described from a male, accompanied with a female, received from Dr. Mitsukuri, which I am informed by Mr. Marlatt, were taken by Mr. Y. Nawa, of Gifu.

Subfamily II, CHALCIDINÆ.

TRIBE I, CHALCIDINI.

Genus CHALCIS Fabricius.

The species known from Japan falling in this genus are *C. formosensis* Ashm., *C. mitsukurii* Ashm., *C. chinensis* Ashm., *C. euplœæ* Westw., *C. obscura* Walk. and *C. mikado* Cam. (= *C. callipus* Kirby).

TRIBE II, SMICRINI.

Genus EPITRANUS Walker.

Epitranus albipennis Walker.

Hiogo.

TRIBE III, CHALCITELLINI.

Genus ANACRYPTUS Kirby.

To this genus belongs *Epitranus erythrogaster* Cam. described from Nagasaki.

Anacryptus japonicus, new species.

Male. — Length, 4.2 mm. Black and shining, but closely punctate, except on the mesonotum and the scutellum, where the punctures are larger and sparser; tips of

femora, the hind trochanters and hind tibiæ behind reddish, the base and apex of front and middle tibiæ, and all tarsi, honey-yellow; scape very long, slender, honey-yellow, the flagellum filiform, brown-black; petiole of abdomen long, longitudinally furrowed, a little longer than the hind femora, opaquely shagreened, the body of abdomen highly polished, shining, not large, subovate and compressed. Wings hyaline, almost bare, the veins brown, the stigmal vein very short, the postmarginal not developed.

Type. — No. 7155, U. S. National Museum.

Hakone. Described from one specimen collected by Mr. A. Koebele.

Anacryptus koebelei, new species.

Female. — Length, 3 mm. Black and shining, closely punctate, except on the middle mesothoracic lobe where the punctures are not so close; front and middle legs, including the coxæ, honey-yellow, all tarsi pale, hind coxæ black, the hind femora brown-black, the hind tibiæ pale on posterior face. Wings hyaline, the veins yellowish the very small stigmal vein brownish. The abdominal petiole in this species, is shorter than the hind femora, longitudinally furrowed, while the body of the abdomen is long ovate, subcompressed, highly polished, the basal segment occupying nearly its whole surface, the following segments all very short.

Type. — No. 7161, U. S. National Museum.

Hakone. Described from one specimen collected by Mr. A. Koebele.

TRIBE IV, HALTICHELLINI.

Genus STOMATOCERAS Kirby.

To this genus belongs *Halticella tinctipennis* Cam. described from Nagasaki. The following species are apparently undescribed.

Stomatoceras hakonensis, new species.

Female. — Length, 6.5 mm. Wholly black, shining, punctate, clothed with a sparse glittering grayish or whitish pubescence, the scutellum with a median longitudinal furrow, the mesopleura coarsely longitudinally striated, the head deeply and broadly excavated in front, the excavation encircled by a rim or carina, the front ocellus placed within the excavation. Wings subfuscous, paler basally, the veins black. The abdomen is conic-ovate, not longer than the thorax, smooth and shining, except the sixth segment which has some distinct thimble-like punctures.

Type. — No. 7157, U. S. National Museum.

Hakone. Described from a single specimen collected by Mr. A. Koebele.

Stomatoceras clavicornis, new species.

Male. — Length, 3–3.5 mm. Black, closely punctate, clothed with a sparse, glittering white pubescence, the central longitudinal furrow on the scutellum only vaguely defined, the mesopleura punctate, not longitudinally striated; flagellum

strongly clavate, black, except basally, the scape and the two or three basal joints of the flagellum being pale or yellowish; tegulæ, middle coxæ, base and tips of front and middle femora, tibiæ and tarsi and hind tarsi, honey-yellow or testaceous, the rest of the front and middle femora and the hind legs brownish or brown-black the hind legs darkest, sometimes black. Wings hyaline, the veins brown. The abdomen is oval, shining, the third segment, and those beyond, faintly, microscopically punctate.

Type. — No. 7158, U. S. National Museum.

Hakone (Mr. A. Koebele).

Family LXIII, EURYTOMIDÆ.

Subfamily I, AXIMINÆ.

Representatives of this group should be found in Japan.

Subfamily II, EURYTOMINÆ.

TRIBE I, ISOSOMINI.

Genus ISOSOMA Walker.

To this genus belongs *Eurytoma antica* Walk., described from Hiogo.

TRIBE II, EURYTOMA Illiger.

Eurytoma appendigaster Swederus.

I have received specimens of this species from Yokohama and Gifu.

Eurytoma nikkoensis, new species.

Female. — Length, 2.4 mm. Black, shallowly umbilicately punctate, the middle mesothoracic lobe anteriorly almost smooth, shining; front legs from base of femora, the middle legs from apical half of femora, and the hind knees, tips of their tibiæ and the tarsi, honey-yellow; wings hyaline, the veins light brown, the marginal vein about one half longer than the stigmal vein, the postmarginal vein delicate, hardly longer than the stigmal. The head is considerably wider than the thorax; antennæ, except a yellow annulus at apex of the pedicel, wholly black, the flagellar joints oblong oval, the first the longest, the others gradually shortening; abdomen ovate, pointed at apex, not longer than the thorax, smooth and shining, subcompressed, the petiole short transverse; the body of the abdomen seen from the side is only a little more than twice as long as wide. The pronotum is only a little wider than long.

Type. — No. 7159, U. S. National Museum.

Nikko. Described from a single specimen collected by Mr. A. Koebele.

Eurytoma atamiensis, new species.

Female. — Length, 1.8 mm. Black, the head and thorax umbilicately punctate; scape of antennæ and the legs, except the hind coxæ and the hind femora,

brownish-yellow; abdomen ovate, ending in a point, smooth and shining, seen from the side it is hardly twice as long as wide; wings hyaline, the veins light brown, the marginal vein nearly twice as long as the stigmal; flagellum brown, the joints 2 to 5, moniliform. The pronotum is twice as wide as long.

Type. — No. 7160, U. S. National Museum.

Atami. Described from seven specimens collected by Mr. A. Koebele.

Eurytoma japonica, new species.

Female. — Length, about 4 mm. Black, the head and thorax umbilicately punctate, clothed with a fine, sparse, whitish pubescence; scape of antennæ and the legs, except the coxæ, honey-yellow, the coxæ black, the incisions of the joints, apices of the tibiæ and the tarsi yellowish-white; flagellum brown-black, the joints oblong, the first about two and one half times as long as thick, the second about twice as long as thick, the following very gradually shortening; wings hyaline, the veins brownish-yellow, the marginal vein nearly twice as long as the stigmal; abdomen ovate, not ending in a projecting point at apex, smooth and shining, seen from the side, a little more than twice as long as wide, only slightly compressed. The pronotum is shorter than the mesonotum, about one and one half times as wide as long.

Type. — No. 7161, U. S. National Museum.

Sapporo. Described from a single specimen received from Dr. Matsumura.

Eurytoma binotata, new species.

Female. — Length, 1.5–2 mm. Resembles *E. atamiensis*, but the pronotum is only one and one half times as wide as long, with a small yellow spot at each anterior angle, the legs are brownish-yellow, with all coxæ and the hind femora black, while the stigmal vein is only two thirds the length of the marginal vein.

Type. — No. 7162, U. S. National Museum.

Atami. Many specimens collected by Mr. A. Koebele.

Eurytoma hakonensis, new species.

Female. — Length, 2.5 mm. Black, umbilicately punctate, but with the face, cheeks and pronotum, except medially, more or less yellow or brownish-yellow; scape of antennæ and legs yellowish, the tarsi whitish, the hind coxæ black, the hind femora brown, except at base and apex; flagellum light brownish, the joints 2–5 moniliform; wings hyaline, the veins yellowish, the marginal vein only a little longer than the stigmal; abdomen short ovate, much shorter than the thorax and only about one and one half times as long as wide. The pronotum is not quite twice as wide as long.

Type. — No. 7168, U. S. National Museum.

Hakone. Described from two specimens collected by Mr. A. Koebele.

Eurytoma mitsukurii, new species.

Female. — Length, 3 mm. Mostly brownish-yellow, the eyes, a transverse line on vertex enclosing the ocelli, the occiput, three lines on the pronotum, a spot on

each mesothoracic lobe, a central stripe on the scutellum and the apices of the dorsal abdominal segments black; wings hyaline, the veins yellowish, the marginal vein very thick, not longer than the stigmal vein. The head anteriorly is deeply excavated for the reception of the antennæ, the flagellum is filiform, joints 2–6, a little longer than thick, the first the longest joint; the pronotum is a little more than twice wider than long; while the hind tibiæ are armed behind with some stiff bristles as in the *Decatomini*.

Type. — No. 7164, U. S. National Museum.

Atami. Described from a single specimen taken by Mr. A. Koebele.

Tribe V, DECATOMINI.

Genus DECATOMA Spinola.

Decatoma atamiensis, new species.

Female. — Length, 1.5 mm. Head, except the vertex and the occiput, the antennæ, the tegulæ, the mesopleura, and the legs, except a spot towards the apex of the hind femora and most of the hind tibiæ, yellow; the vertex, occiput, rest of the thorax, a spot on hind femora towards apex, and the hind tibiæ, except the apical fourth and a narrow annulus at base, black. Wings hyaline, the veins, except the semicircular stigma, which is brown-black, pale yellowish; there is a subfuscous fascia extending from the stigma to beyond the middle of the wing.

Type. — No. 7165, U. S. National Museum.

Atami. Described from one specimen collected by Mr. A. Koebele.

Family LXIV, PERILAMPIDÆ.

Genus PERILAMPUS Latrielle.

Perilampus japonicus, new species.

Female. — Length, 4 mm. Head, legs, except the tarsi, and the abdomen blue-black, smooth and shining; tarsi honey-yellow; thorax æneous-black, the dorsum with a greenish tinge, coarsely, closely punctate, except the lateral mesothoracic lobes which are smooth and shining, scape and pedicel æneous; flagellum brown-black, a little paler or brown at apex; wings hyaline, the veins brown.

Male. — Length, 2.5 mm. Agrees with female, except in size, and in having the head and scutellum metallic greenish, the legs æneous-black, the tarsi longer and slenderer, light brownish.

Type. — No. 7166, U. S. National Museum.

Sapporo. Described from a ♀ and ♂, labelled No. 15, received from Dr. Matsumura.

Family LXV, EUCHARIDÆ.

Genus SCHIZASPIDIA Westwood.

Schizaspidia tenuicornis, new species.

Female. — Length 4 mm. Head and thorax metallic-green, the abdomen black, the petiole yellow at apex; mandibles, antennæ and legs, except the hind coxæ,

light brownish-yellow, the tarsi paler; wings hyaline, the marginal and short stigmal vein brown, the latter enclosed in a small, fuscous cloud. The head, except some longitudinal striæ on the face, is smooth; the antennæ are long, the joints of the flagellum being rather long and cylindrical, the first joint about six times as long as thick; the thorax is coarsely rugose, with distinct parapsidal furrows, the scutellum produced at apex and ending in two short prongs; the abdomen is longly petiolated, the petiole being longer than the hind femora, smooth and shining, brown or brown-black with its apex yellow, while the body of the abdomen is ovate, a little more than twice longer than thick.

Type. — No. 7167, U. S. National Museum.

Sapporo. Described from two specimens (one imperfect) received from Dr. Matsumura.

Family LXVI, MISCOGASTERIDÆ.

Subfamily II, TRIDYMINÆ.

Genus **TRIDYMUS** Ratzeburg.

Tridymus hakonensis, new species.

Female. — Length, 1.5 mm. Æneous-black, smooth, the head anteriorly, the middle mesothoracic lobe, and the scutellum brassy; legs æneous, the tibiæ brown, the tarsi yellowish; wings hyaline, the veins brown; abdomen conic-ovate, subcompressed, pointed at apex, the sides metallic-greenish.

Type. — No. 7180, U. S. National Museum.

Hakone. Described from two specimens collected by Mr. A. Koebele.

Subfamily III, MISCOGASTERINÆ.

Tribe I, HALTICOPTERINI.

Genus **HALTICOPTERA** Spinola.

Halticoptera laticeps, new species.

Male. — Length, 2.6 mm. Robust, blue-black, the dorsum of the thorax dull bronzed; scape of antennæ, the mandibles, except the teeth and the legs, except the coxæ, honey-yellow, the tarsi pale yellowish, the femora medially more or less brownish; wings hyaline, the veins brown, abdomen bluish. The head is very wide, fully four times as wide as thick antero-posteriorly, the space between the eyes being very wide, the ocelli pale, arranged in an obtuse triangle; flagellum brown-black, the joints, except the first and second, a little wider than long.

Type. — No. 7181, U. S. National Museum.

Hakone. Described from one specimen received from Mr. A. Koebele.

Family LXVIII, ENCYRTIDÆ.

Subfamily I, EUPELMINÆ.

Tribe I, EUPELMINI.

Genus CALOSOTER Walker.

Calosoter albitarsis, new species.

Female. — Length, 2.4 mm. Head, except the eyes, the antennæ and the thorax, except a streak at each side of the mesonotum, the scutellum, the mesopleura and the metanotum which are metallic brown-black, brownish-yellow; legs, except the tarsi and hind femora and tibiæ, brownish-yellow, the tarsi, except last joint, and the apical third of hind femora, white, rest of hind femora and the hind tibiæ, black; wings hyaline, the veins light brown, the marginal vein very long and slender; abdomen conic-ovate, longer than the thorax, compressed, pointed at apex, and with a bronzed metallic tinge.

Type. — No. 7172, U. S. National Museum.

Atami. Described from three specimens collected by Mr. A. Koebele.

Genus ANASTATUS Motschulsky.

Anastatus japonicus, new species.

Female. — Length, 2 mm. Head and thorax closely, finely punctulate, gold-green, the frontal furrow with a bluish tinge, the collar bluish or violaceous, the mesopleura posteriorly brownish; antennæ brown-black, the scape at base and beneath, the sutures of the trochanters, middle coxæ beneath, base of their tibiæ and the tibial spurs, yellow, rest of legs brown-black, the hind legs æneous-black; abdomen black, with a yellowish band at base beneath. Wings with the apical two thirds fuscous, the basal one third and a curved band across from the stigmal vein hyaline or whitish.

Male. — Length, 1.6 mm. Æneous black, the head and sides of thorax tinged with blue, the disk of the mesothorax metallic-green, the parapsidal furrows deep, distinct, the abdomen black; legs æneous-black, the front tibiæ and tarsi light brown, an annulus at base of the tibiæ and the hind tarsi, white. Wings clear hyaline, the veins brown, the stigmal vein about one third the length of the submarginal vein, the stigmal vein about one third the length of the marginal and ending in a little knob, the postmarginal fully two thirds the length of the marginal. The antennæ are black or brown-black, the flagellum long, filiform, densely pubescent, the joints nearly twice as long as thick.

Type. No. 7168, U. S. National Museum.

Atami. Decribed from several specimens received from Mr. A. Koebele.

Anastatus gastropachæ, new species.

Female. — Length, 1.8–2 mm. Head metallic-bronzed green, the thorax brownish-yellow, the middle mesothoracic lobe blue, the abdomen æneous black; scape of antennæ and the legs brownish-yellow, the tarsi pale, the middle tibiæ more or less

fuscous; flagellum long, subclavate, fuscous or brown-black; wings much abbreviated and narrowed, fuscous, with a transverse band at base and apical third hyaline.

Type. — No. 7169, U. S. National Museum.

Sapporo. Described from four female specimens received from Dr. Matsumura, and bred from the eggs of a Lepidopteron, *Gastropacha* sp.

Anastatus brevipennis, new species.

Female. — Length, 3 mm. Æneous-black, the disk of the mesonotum and the abdomen with a bluish tinge, the latter with a white band at base; scape of antennæ and legs, except as noted, brownish-yellow, coxæ and femora brown, the hind tibiæ more or less fuscous; flagellum subclavate, brown-black; wings much abbreviated, narrowed, the apical two thirds fuscous, but divided by a transverse white band; the base of the wings hyaline.

Type. — No. 7170, U. S. National Museum.

Gifu. Described from two specimens received from Mr. Y. Nawa.

Anastatus albitarsis, new species.

Female. — Length, 2 mm. Metallic-greenish, the abdomen æneous-black, with a white band at base; antennæ brown-black; legs æneous-black, the trochanters and tibiæ brown, the tips of the tibiæ and the tarsi yellowish; wings fuscous, the tips paler, the basal fourth hyaline, the fuscous part with two white triangular spots vis-a-vis.

Type. — No. 7171, U. S. National Museum.

Hakone. Described from a single specimen collected by Mr. A. Koebele.

Genus EUPELMUS Dalman.

Eupelmus formosæ, new species.

Female. — Length, 2.8 mm. Ovipositor projecting, yellowish with the tip black. Bronzed green, the collar and the prosternum and the anterior part of the mesosternum bluish; scape of antennæ and the legs, except as noted, brownish-yellow, the tarsi paler, the hind coxæ æneous-black, the hind femora metallic brown at basal two thirds; wings hyaline, the veins light brown, the marginal vein very long, about four times as long as the stigmal.

Type. — No. 7173, U. S. National Museum.

Formosa. Described from a single specimen collected by Mr. A. Koebele.

Subfamily II, ENCYRTINÆ.

Tribe III, MIRINI.

Genus COPIDOSOMA Ratzeburg.

Copidosoma japonicum, new species.

Male. — Length, 1 mm. Æneous black, the mesonotum with a metallic-greenish tinge, smooth, impunctate; antennæ black, the flagellum subclavate; legs

brown, an annulus at base of front and middle tibiæ and the tarsi, pale yellowish; wings hyaline, the marginal vein punctiform, brown.

Type. — No. 7174, U. S. National Museum.

Gifu. Described from eight specimens received from Mr. Y. Nawa.

Genus APHYCUS Mayr.

Aphycus albopleuralis, new species.

Female. — Length, 1.5 mm. Head, except the eyes, the antennæ, except at apex, the prothorax, mesopleura and the legs waxy white, the mesonotum and the scutellum yellowish-brown; abdomen yellowish with some brownish stains on disk above; wings hyaline, the veins pale.

Type. — No. 7176, U. S. National Museum.

Gifu. Described from two specimens received from Mr. Y. Nawa.

Genus MICROTERYS Thomson.

Microterys japonicus, new species.

Female. — Length 1.2 mm. Yellowish-brown, the disk of the abdomen towards base tinged with brown; scape, pedicel and legs pale yellowish; funicle joints 1 to brown, 2 and 6 pure white, the club black or fuscous; wings hyaline with three transverse fuscous bands, the first very broad, the second narrow, the third at the apical fourth of the wing, with a small triangular hyaline spot on its outer margin near the apex of the wing.

Type. — No. 7177, U. S. National Museum.

Gifu. Described from three specimens received from Mr. Y. Nawa.

Genus SYRPHOPHAGUS Ashmead.

Syrphophagus nigrocyaneus, new species.

Female. — Length, 1.5 mm. Blue-black, the head with some sparse punctures on the vertex; antennæ brown-black; legs brown-black, the knees, tips of tibiæ of the front and hind legs and all tarsi pale yellowish, the middle tibiæ, except a pale annulus at base, fuscous; wings hyaline, the marginal and stigmal veins brown.

Type. — No. 7178, U. S. National Museum.

Japan. Described from one specimen collected by Mr. A. Koebele, but without an exact locality label.

Genus TACHINÆPHAGUS Ashmead.

Tachinæphagus fuscipennis, new species.

Female. — Length, 1.6 mm. Dark blue, the head and thorax sparsely, microscopically punctate; antennæ brown-black, the flagellum clavate, the funicle joints transverse, the club large; wings fuscous, the basal third hyaline, the subcostal vein, except at apex, yellowish, the apex of the subcostal vein, the marginal, stigmal and postmarginal veins brown; legs dark brown or fuscous, the knees, tips of tibiæ and the tarsi pale yellowish or whitish.

Type. — No. 7182, U. S. National Museum.

Atami and Hakone. Many specimens collected by Mr. Albert Koebele.

Genus CHEILONEURUS Westwood.

Cheiloneurus japonicus, new species.

Female. — Length, 1.6 mm. Yellowish-brown, the head on the vertex and the hind margin of mesonotum (broadly) metallic-bluish, the latter clothed with a silvery white pubescence, the abdomen metallic-greenish; last six joints of antennæ dilated, black and very pubescent; front wings with the apical two thirds dark fuscous, the basal third and the hind wings hyaline; legs brownish-yellowish, the tips of the middle femora, a spot at base of their tibæ and the hind femora and tibiæ, except a white annulus at base, fuscous.

Type. — No. 7183, U. S. National Museum.

Gifu. Described from three specimens, labelled No. 85, received from Mr. Y. Nawa.

Genus CERAPTEROCEROIDES Ashmead.

Cerapteroceroides, new genus.

In having the wings marked with fuscous rays this genus agrees with *Cerapterocerus* Westw. and *Habrolepis* Först., but from the former it is easily separated by the head which is not oblong but short or lenticular; while from the latter it is separated by the antennæ which are strongly compressed or dilated, ribbon-shaped.

Cerapteroceroides japonicus, new species. (Plate VII, Fig. 2).

Female. — Length, 2 mm. Æneous black, with a bluish tinge, some specimens being peacock-blue; antennæ strongly compressed, dull black, the scape brownish; wings with fuscous rays as in *Habrolepis;* legs æneous black, the tips of the tibiæ and the tarsi, pale yellowish, the front tarsi whitish.

Type. — No. 7179, U. S. National Museum.

Atami (Mr. A. Koebele) and Gifu (Mr. Y. Nawa).

Family LXIX, PTEROMALIDÆ.

Subfamily I, PTEROMALINÆ.

Tribe III, EUTELINI.

Genus PLATYTERMA Walker.

Platyterma atamiense, new species.

Female. — Length, 1.5 mm. Bluish-green, the head and thorax shagreened; scape, pedicel and legs, except coxæ, honey-yellow; flagellum subclavate, not long, the funicle joints 2 to 6 wider than long; abdomen æneous black, conic-ovate, pointed at apex, a little shorter than the thorax. Wings hyaline, the veins light brown, the

marginal vein not short, the stigmal vein rather long, clavate about two thirds the length of the marginal, the postmarginal vein longer than the stigmal.

Type. — No. 7184, U. S. National Museum.

Atami. Described from four specimens collected from Mr. A. Koebele.

Subfamily II, MERISINÆ.

Genus HOMOPORUS Thomson.

Homoporus japonicus, new species.

Female. — Length, 2.8 mm. Bluish-green, the head and thorax punctate; antennæ light brown, the scape yellowish, the funicle joints 2–6 transverse; abdomen broadly oval, depressed, æneous, rounded at apex and not longer than the thorax; legs metallic brown-black, with the tips of the femora and the tibiæ and tarsi pale yellowish. Wings hyaline, with a large fuscous cloud beneath the marginal vein, the veins brown.

Type. — No. 7185, U. S. National Museum.

Atami. One specimen received from Mr. A. Koebele.

Subfamily IV, SPHEGIGASTERINÆ.

Tribe I, ASAPHINI.

Genus PARASAPHES Ashmead.

Parasaphes japonicus, new species.

♀. Length, 1.8 mm. Æneous black; flagellum brown; femora, except tips and the hind tibiæ reddish-brown, the tips of the femora, the front and the middle tibiæ and all tarsi pale yellowish; abdomen clavate, the petiole 2½ times as long as thick; wings hyaline, the veins brown, the marginal vein very long and slender, nearly as long as the submarginal, the stigmal vein very short, subpetiolate, ending in a little knob.

Type. — No. 7186, U. S. National Museum.

Atami. Described from one specimen collected by Mr. A. Koebele.

Parasaphes flavipes, new species.

♀. Length, 1.6 mm. Head and thorax metallic greenish, shagreened; abdomen polished black, the petiole about twice as long as thick; scape of antennæ and the legs, including the coxæ, pale yellowish; flagellum long, brown; wings hyaline, the veins brownish, the marginal vein hardly two thirds the length of the subcostal, thickened towards apex, the stigmal vein thickened, much longer than in the previous species, more nearly as in the genus *Asaphes* Walk.

Type. — No. 7187, U. S. National Museum.

Formosa. Several specimens, labelled 1366, bred by Mr. A. Koebele.

Tribe II, PACHYNEURINI.

Genus PACHYNEURA Walker.

Pachyneura nawai, new species.

♀. Length, 1.5–1.8 mm. Head and thorax dull bronzed green, finely sculptured; abdomen metallic black; legs, except the coxæ, testaceous, the tibiæ and tarsi pale yellowish; wings hyaline, the veins brown, the marginal vein about four times as long as thick.

Type. — No. 7168, U. S. National Museum.

Gifu (Mr. Y. Nawa); Atami (Mr. A. Koebele). Bred from an unknown Aphis.

Pachyneura mitsukurii, new species.

♀. Length, 1.4 mm. Head and thorax bluish-green, sculptured; abdomen ovate, æneous; scape of antennæ and the legs pale or yellowish-white, the flagellum brown; wings hyaline, the veins brown, the marginal vein about thrice as long as thick.

Type. — No. 7188, U. S. National Museum.

Japan. Four specimens received from Dr. Mitsukuri. The specimens are mounted on cardboard and I cannot see the color of the coxæ; they are probably metallic.

Pachyneuron gifuensis, new species.

♀. Length, 1 mm. Head and thorax æneous black; antennæ brown; coxæ black, the femora dark brown, the tips and the tibiæ and tarsi yellowish-white; wings hyaline, the veins brown, the marginal vein thrice as long as thick.

Type. — No. 7190, U. S. National Museum.

Gifu. Described from three specimens bred by Mr. Y. Nawa from an Aphis.

Tribe III, SPHEGIGASTERINI.

Genus ACROCLISIS Förster.

Acroclisis coccidivora, new species.

♀. Length, 1.4 mm. Æneous-black, the head and thorax finely sculptured; antennæ brown, the scape yellowish; legs, except coxæ, honey-yellow, the knees, tips of tibiæ and the tarsi, whitish; wings hyaline, the veins light brownish, the stigmal vein a little shorter than the marginal.

Type. — No. 7191, U. S. National Museum.

Japan (exact locality not given). Described from five specimens, labelled No. 126, bred by A. Koebele from a Coccid.

Genus TRIGONOGASTRA Ashmead.

Trigonogastra hakonensis, new species. (Pl. VIII, Fig. 3.)

♀. Length, 1.5 mm. Head and thorax bronze green, finely sculptured; abdomen æneous petiolated, the body triangular, much as in *Perilampus:* antennæ

brown, the scape yellowish; legs, except the coxæ, honey-yellow, the knees, tibiæ towards apex, and the tarsi yellowish-white; wings hyaline, the veins light brownish, the marginal vein not short, the stigmal vein ending in a little knob, less than two thirds the length of the marginal, the postmarginal longer than the stigmal.

Type. — No. 7192, U. S. National Museum.

Hakone. One specimen received from Mr. A. Koebele.

Genus CRYPTOPRYMNUS Förster.

Cryptoprymnus japonicus, new species.

♀. Length, 3 mm. Head and thorax bronze green, closely punctulate; abdomen æneous black, petiolated, the petiole shagreened; antennæ brown, the scape yellowish; legs, except the coxæ and the femora, very pale yellowish, the coxæ metallic, the femora, except at apex, reddish brown; wings hyaline, the veins brownish, the stigmal vein two thirds the length of the marginal, ending in a little knob, the postmarginal almost as long as the marginal.

Type. — No. 7193, U. S. National Museum.

Japan (exact locality not given). Described from a single specimen, labelled No. 1266, received from Mr. A. Koebele, evidently bred, but the host is unknown.

Family LXX, ELASMIDÆ.

Genus ELASMUS Westwood.

Elasmus atamiensis, new species.

♀. Length, 2–2.1 mm. Æneous black, the pronotum bluish, the head with close thimble-like punctures, the thorax with a scaly punctuation; flagellum brown; scape of antennæ, the mandibles, a spot at extreme apex of the scutellum, and the legs, except the front coxæ basally, middle and hind coxæ and the hind femora, which are concolorous with the thorax, yellowish-white, the hairs on the hind tibiæ are arranged to form five cells or areas; wings hyaline, with a fuscous cloud across from the apex of the short stigmal vein.

Type. —No. 7195, U. S. National Museum.

Atami (Mr. A. Koebele). Many specimens.

Elasmus hakonensis, new species.

♀. Length, 1.8 mm. Greenish-blue, the head with thimble-like punctures, the thorax with a scaly punctuation; flagellum brown; scape, mandibles, spot above tegulæ, apex of scutellum, abdomen at base and beneath and a band above, and the legs except as hereafter noted, yellowish or yellowish-white, the apex of middle and hind femora broadly banded with black, the hind tibiæ with the hairs arranged on its outer face to form seven areas, the first row composed of four areas, the second of three; wings hyaline, faintly clouded across from the stigmal vein.

Type. — No. 7196, U. S. National Museum.

Hakone (Mr. A. Koebele).

Elasmus japonicus, new species.

♀. Length, 2.5 mm. Head and thorax yellowish, a spot on vertex, enclosing the ocelli, a spot on pronotum medially, a median spot on mesonotum posteriorly, a spot on the axillæ, a large spot on disk of scutellum and the metanotum black; abdomen reddish-brown, the apex and three spots on basal segment black; flagellum brown; legs yellowish-white, with a black hair-line on their superior edge, the hind tibiæ with the hairs arranged on its outer face to form at least nine areas; wings hyaline, the veins brown.

Type. — No. 7197, U. S. National Museum.

Gifu. Described from four specimens received from Mr. Y. Nawa.

Family LXXI, EULOPHIDÆ.

Subfamily I, ENTEDONINÆ.

Tribe III. ENTEDONINI.

Genus PLEUROTROPIS Förster.

Pleurotropis atamiensis, new species.

♀. Length, 1 mm. Æneous, the head above, the disk of the metanotum, and the metapleura, with a metallic greenish-tinge, vertex punctate, the mesonotum scaly-punctate; flagellum brown, pubescent, the funicle joints moniliform; legs æneous-black, the tips of the tibiæ and the tarsi, whitish, the hind femora with a metallic bluish tinge; wings hyaline, the very long marginal vein and the very short subsessile stigmal vein light brown; abdomen conic-ovate, petiolated, with a bluish tinge, the petiole about four times as long as thick, the first segment of the abdomen occupies about half the whole surface.

Type. — No. 7198, U. S. National Museum.

Atami (Mr. A. Koebele). Two specimens.

Genus DEROSTENUS Westwood.

Derostenus bifoveolatus, new species.

♀. Length, 1.2 mm. Metallic peacock blue on vertex of head and disk of the thorax, otherwise dark bluish, except the pronotum which is brassy; tarsi, except last joint, white; mesonotum and the scutellum delicately reticulated with delicate grooved lines, the mesonotum with two umbicate punctures posteriorly just in front of the scutellum; wings hyaline, the nervures brown, the marginal vein very long, the stigmal vein very short.

Type. — No. 7199, U. S. National Museum.

Atami (Mr. A. Koebele). One specimen.

Derostenus nawai, new species.

♂, ♀. Length, 1.3 mm. Dark blue, the disk of the thorax and the abdomen æneous, tarsi, except last joint, white; mesonotum normal, without the foveæ at base, wings hyaline, the veins brown; abdomen in female conic-ovate, as long as the

thorax, the first body segment occupying half the whole surface, in male, short-oval, not more than half the length of the thorax, the first body segment occupying two thirds the whole surface.

Type. — No. 7200, U. S. National Museum.

Gifu (Mr. Y. Nawa).

Derostenus mitsukurii, new species.

♀. Length, 1–1.2 mm. Dark blue, the head above and the disk of the thorax æneous, the abdomen dark blue, the thorax above and the scutellum delicately reticulated; flagellum brown; legs, except the coxæ, pale or yellowish-white; wings hyaline, the veins light brown; abdomen oval, only about two thirds the length of the thorax, the first body segment occupying most of the surface, the following very short, retracted.

Type. — No. 7201, U. S. National Museum.

Japan (Dr. Mitsukuri). Many specimens.

Tribe IV, PEDIOBIINI.

Genus NESOMYIA Ashmead.

Nesomyia albipes, new species.

♀. Length, 2 mm. Metallic blue-green, the cheeks and the clypeus brassy, the abdomen conic-ovate, æneous black, the middle lobe of the mesonotum and the scutellum scaly punctate, the parapsidal furrows indicated by depressions only; flagellum black, finely pubescent; legs, except coxæ and the last joint of the tarsi, waxy-white; wings hyaline, the disk of the front wings with a subfuscous cloud, the veins light brown, the marginal vein very long, the stigmal vein very short, ending in a little knob, the postmarginal vein long.

Type. — No. 7202, U. S. National Museum.

Atami (Mr. A. Koebele). One specimen.

Nesomyia cinctiventris, new species.

♀. Length, 1.1 mm. Blue, the head behind and on the clypeus, and the tip of the abdomen æneous, the abdomen conically pointed, as long or a little longer than the head and thorax united with a transverse yellowish or whitish band just beyond the base; scape and legs waxy-white, the flagellum light brownish; wings hyaline, the veins pale.

Type. — No. 7739, U. S. National Museum.

Gifu (Mr. Y. Nawa). Two specimens.

Subfamily II, APHELININÆ.

Genus APHELINUS Dalman.

Aphelinus japonicus, new species.

♀. Length, 0.6 mm. Honey-yellow, the eyes light brown, the occiput above dusky, the scutellum, post-scutellum and a spot on each side of the middle bluish-

black; antennæ, legs and abdomen beneath yellowish-white; wings hyaline, the veins pale yellowish.

Type. — No. 7203, U. S. National Museum.

Atami (Mr. A. Koebele). Two specimens.

Subfamily III, TETRASTICHINÆ.

Tribe II, TETRASTRICHINI.

Genus TETRASTICHODES Ashmead.

Tetrastichodes pallidipes, new species.

♀. Length, 1.6 mm. Bluish-æneous, the middle mesothoracic lobe with a decided metallic greenish tinge, smooth and shining; a large rounded spot on disk of abdomen, the scape of the antennæ and the legs, pale yellowish or yellowish-white; flagellum brown; wings hyaline, iridescent, the veins pale; abdomen conic-ovate, fully as long as the head and thorax united.

♂. Length, 0.8 mm. Æneous black, the flagellum longer, light brown, clothed with some long sparse hairs, the legs waxy white.

Type. — No. 7204, U. S. National Museum.

Hakone (Mr. A. Koebele).

Genus TETRASTICHUS Haliday.

Tetrastichus hakonensis, new species.

♀. Length, 1.5 mm. Robust, æneous black, impunctate; flagellum dark brown, the first joint about thrice as long as thick, the others gradually becoming shorter; legs black, with the trochanters at apex, apices of the femora and all tibiæ and tarsi pale yellowish; wings hyaline, the veins pale.

Type. — No. 7205, U. S. National Museum.

Hakone (Mr. A. Koebele).

Tetrastichus atamiensis, new species.

♀. Length, 1 mm. Black with a faint bluish tinge in certain lights; scape of antennæ and the legs, except as noted, yellowish-white, coxæ, a spot on the trochanters and the hind femora, on the basal half, black; abdomen ovate, not longer than the thorax; wings hyaline, the veins pale yellowish.

Type. — No. 7206, U. S. National Museum.

Atami (Mr. A. Koebele).

Tetrastichus tricolor, new species.

♀. Length, 1.8–2 mm. Brownish-yellow, the occiput and a spot on the lateral mesothoracic lobes posteriorly black, a large spot on the middle mesothoracic lobe blue-black; abdomen except a streak along the middle of the venter, æneous black; flagellum brownish; wings hyaline, the veins pale.

Type. — No. 7207, U. S. National Museum.

Atami and Hakone (Mr. A. Koebele). Many specimens.

Subfamily IV, ELACHERTINÆ.

TRIBE I, EUPLECTRINI.

Genus EUPLECTRUS Westwood.

Euplectrus japonicus, new species.

♂. Length, 1.5 mm. Black and shining, the abdomen with a yellow spot at base above, brownish-yellow beneath; antennæ and legs pale yellowish, the front and middle coxæ yellowish-white, the hind coxæ black; wings hyaline, the veins pale.

The head is highly polished, impunctate, clothed with some sparse long hairs; the pedicel is obconical, a little longer than thick at apex; first funicle joint stouter, about 1½ times as long as thick, the second hardly longer than thick, the third and fourth stouter, a little wider than long; club short, ovate, stouter; the mesonotum is finely rugulose but without a median carina posteriorly, the scutellum including the axillæ and the metathorax are perfectly smooth, highly polished, the latter with a sharp median carina.

Type. — No. 7208, U. S. National Museum.

Japan. Described from a single specimen, labelled No. 1303, bred by Mr. A. Koebele, from an unknown noctuid larva.

Euplectrus nigromaculatus, new species.

♀. Length, 1.6 mm. Brownish-yellow, the eyes brown, a transverse band on occiput, one on the front of the pronotum and one on the front of the mesonotum, a spot on the lateral mesothoracic lobe, the metathorax, and spots on the lateral margins of the abdomen, black; scape and legs yellowish-white; flagellum brownish; wings hyaline, the marginal and postmarginal veins brown, the submarginal and the stigmal veins yellowish.

Type. — No. 7209, U. S. National Museum.

Hakone (Mr. A. Koebele). Many specimens.

Tribe II, OPHELININI.

Genus SYMPIESOMORPHA Ashmead.

Sympiesomorpha japonica, new species. (Pl. VIII, Fig. 5.)

♀. Length, 2 mm. Brownish-yellow, the middle of the head, the prothorax above, the apex of the scutellum and the metanotum, black; eyes brown-black; abdomen æneous, beneath and sometimes the sutures above pale; scape of antennæ and the legs yellowish-white; flagellum brown; wings hyaline, the veins pale-yellowish.

Type. — No. 7220, U. S. National Museum.

Gifu (Mr. Y. Nawa). Two specimens.

Genus OPHELINOIDEUS Ashmead.

Ophelinoideus japonicus, new species. (Pl. VIII, Fig. 4.)

♀. Length, 3.5 mm. Dull bronzed green, closely punctate, the head in front with a bluish green tinge, the abdomen æneous; scape of the antennæ, tips of troch-

anters, tips of the femora and all tibiæ and tarsi except the last joint, pale yellowish; wings hyaline, the veins brown.

Type. — No. 7211, U. S. National Museum.

Hakone (Mr. A. Koebele). Three specimens.

Tribe III, ELACHERTINI.

Genus ELACHERTUS Spinola.

Elachertus atamiensis, new species.

♀. Length, 1.5 mm. Æneous black, smooth and shining, the middle mesothoracic lobe and the scutellum with a metallic greenish tinge, and the lateral mesothoracic lobes and the axillæ with a bluish tinge; scape of antennæ and the legs pale honey-yellow, the hind coxæ usually metallic; flagellum brown-black, the funicle joints moniliform; wings hyaline, the veins pale brownish.

Type. — No. 7212, U. S. National Museum.

Atami (Mr. A. Koebele). Three specimens.

Elachertus basilaris, new species.

♀. Length, 1.7 mm. Æneous black, impunctate, the abdomen with a yellow band at base; scape of antennæ and the legs from the tips of the femora downwards honey-yellow, the coxæ and femora æneous black; flagellum light brown, the funicle joints, except the last, longer than wide; wings hyaline, the veins brown.

Type. — No. 7213, U. S. National Museum.

Gifu (Mr. Y. Nawa).

Subfamily V, EULOPHINÆ.

Tribe I, EULOPHINI.

Genus SYMPIESIS Förster.

Sympiesis mikado, new species.

♀. Length, 4–5 mm. Head and thorax closely punctured, metallic green, the metanotum and the long conically-pointed abdomen, which is more than twice as long as the head and the thorax united, are bottle blue, occasionally tinged with green; scape of antennæ and the legs, except the hind coxæ, which are gold-green and sculptured, honey-yellow; wings hyaline, the veins brown.

Type. — No. 7214, U. S. National Museum.

Atami (Mr. A. Koebele). Many specimens.

Genus EULOPHUS Geoffroy.

Eulophus albitarsis, new species.

♀. Length, 2 mm. Æneous black, sometimes bluish-green, the mesothorax shagreened, the scutellum more delicately shagreened, the axillæ smooth, in marked contrast with the mesonotum and the scutellum; legs black, except an annulus at base of front and middle tibiæ and all tarsi which are honey yellow, the last tarsal joint fuscous; wings hyaline, the veins brown.

Type. — No. 7215, U. S. National Museum.

Atami (Mr. A. Koebele). Four specimens.

Eulophus striatipes, new species.

♀. Length, 1.6 mm. Greenish-blue, the thorax shagreened; legs, except the coxæ and a stripe on femora above, pale yellowish or yellowish-white, the coxæ metallic, the femora with a delicate fuscous stripe above; wings hyaline, the veins brownish-yellow; abdomen oblong-oval, depressed, as long as the head and thorax united, the sheaths of the ovipositor slightly projecting. The antennæ are broken off and cannot be described.

Type. — No. 7216, U. S. National Museum.

Atami (Mr. A. Koebele). One specimen.

Eulophus japonicus, new species.

♀. Length, 2 mm. Head and thorax closely punctured, metallic green, the abdomen long ovate, æneous black; scape of antennæ, trochanters, apices of femora, the base and apex of tibiæ and all tarsi, except the last joint, yellowish-white; flagellum brown-black; wings hyaline, the veins brown, the marginal vein a little more than twice as long as the stigmal vein.

Type. — No. 7217, U. S. National Museum.

Japan (exact locality unknown). One specimen received from Mr. A. Koebele.

Family LXXII, TRICHOGRAMMIDÆ.

Genus TRICHOGRAMMA Westwood.

Trichogramma japonicum, new species.

♀. Length, 0.5–0.6 mm. Piceous black, shining; palpi white; scape of antennæ pale yellowish, the pedicel and the flagellum brownish-yellow; legs yellowish-white, immaculate; wings hyaline, with delicate hair-lines, the venation light brownish, the stigmal vein as long as the marginal, oblique, scarcely bent; abdomen sessile, ovate, not longer than the head and thorax united, flat above, convex beneath and pointed at apex, the ovipositor slightly projecting beyond the tip of the abdomen.

Type. — No. 7218, U. S. National Museum.

Gifu. Several specimens bred by Mr. Y. Nawa from unknown lepidopterous eggs; they are mounted on cardboard, together with a *Telenomus*, and labelled No. 78.

EXPLANATION OF PLATES VII AND VIII.

Fig. 1. *Dendrocerus ratzeburgi* Ashmead (Jour. N. Y. Ent. Soc., XII, 70, 1904).

Fig. 2. *Cerapterocerοides japonicus* Ashmead.

Fig. 3. *Trigonogastra hakonensis* Ashmead.

Fig. 4. *Ophelinoideus japonicus* Ashmead.

Fig. 5. *Sympiesmorpha japonica* Ashmead.

Class I, HEXAPODA.

Order II. COLEOPTERA.

A SPECIES OF THE TENEBRIONID GENUS LATHETICUS IN THE UNITED STATES.

By F. H. CHITTENDEN, Sc.D.,

WASHINGTON, D. C.

For many years there were present in the British Museum specimens of an unidentified genus of Tenebrionidæ. The species awaited description until the year 1880, when Mr. C. O. Waterhouse ventured its characterization as *Latheticus oryzæ* in Volume V of the Annals and Magazine of Natural History (fifth ser., pp. 147–148).

March 3, 1897, the late H. G. Hubbard collected in the Colorado desert, at Indio, in Riverside county, in southern California, a series of a species at once recognizable as related to *L. oryzæ* both by the description and the illustration published in "Aid to the Classification of Insects" (Plate 15). A brief notice of this was given by Mr. E. A. Schwarz before the Entomological Society of Washington, May 13, 1897 (Proc. Ent. Soc. Wash., Vol. IV, p. 187). Other specimens were reared in 1902 by Messrs. H. S. Barber and E. A. Schwarz from dead mesquite branches at Hot Springs, Yavapai county, Arizona.

It is remarkable that an American species of this genus should exist while no other than the oriental form which has hitherto represented the genus has been discovered. It serves to accentuate the Asiatic character of the fauna of the arid region of southwestern North America.

Specimens of *L. oryzæ* taken from a London granary have been kindly furnished by Mr. G. C. Champion for comparison.

Before proceeding to its description Waterhouse's definition of the genus may be repeated as it is published where not accessible to many American collectors.

Genus LATHETICUS Waterhouse, 1880.

General form of *Tribolium*. Mentum transverse, the anterior angles rounded, the front margin gently emarginate in the middle, the ligula not much projecting, transverse, emarginate in the middle; the labial palpi short, the apical joint very large, one third longer than broad, subparallel (but narrowed at the base), truncate at the apex. The inner lobe of the maxillæ terminating in a very slender, acute hook,

with a broad fringe within; the outer lobe slender, terminating with curved stiff hairs; the palpi stout, the penultimate joint subquadrate, the apical joint about twice and a half as long as broad, cylindrical, narrowed at the apex. Labrum extremely short. Epistoma trapeziform, emarginate anteriorly, the ocular canthus not projecting laterally beyond the eyes. Eyes moderately prominent, very coarsely granular. Antennæ nearly as long as the head; the two basal joints not visible from above; the third joint the narrowest, about as long as broad; the fourth, fifth and sixth joints transverse, each a trifle broader than the preceding, the seventh joint distinctly larger than the sixth; the eighth the largest (still transverse), the ninth and tenth a little narrower than the eighth; the eleventh still narrower, somewhat flattened, obliquely truncate at its apex. The rest as in *Tribolium*.

Latheticus prosopis, new species. (Fig. 3.)

Body four times as long as wide, sides parallel, moderately convex above, pale brownish-yellow, surface moderately polished. Head prominent, only slightly narrower than the prothorax. Front and epistoma moderately convex, nearly twice as wide as long, gradually narrowing, declivous anteriorly and at sides, anterior margin narrowly reflexed, ocular canthus prominent, encroaching somewhat upon the eye. Eyes rather finely granulate, above very narrow, below separated by a space about two and one-half times the oblique (longest) diameter of one eye. Mandibles prominent, acutely and finely bifid at apex, inner portion with feebly marked tooth. Antennæ with first six joints about as long as club, second joint visible from above. Prothorax about as long as wide, rounded anteriorly, considerably narrowing posteriorly, with base much narrower than the elytra, angles acute, surface not so densely punctured as in *oryzæ*, base and sides very finely margined. Elytra of same width as prothorax at its widest part, about two and one third times as long as wide, sides parallel, acutely angulate at base; each elytron with six or seven less regular, scarcely impressed rows of punctures. Punctuation of the prosternum more dense than in *oryzæ*, otherwise with the exception of the prothorax and elytra the punctuation throughout is scarcely different. Length, 2.7–3.0 mm.; width, 0.7–0.75 mm.

Habitat. — Indio, Cal., and Hot Springs, Ariz., under bark of a dead mesquite (*Prosopis juliflora*).

Type. — No. 7895, U. S. National Museum.

The general appearance, color and punctuation is very similar to the Asiatic *L. oryzæ*, but the body is a little more slender, the length of the latter being less than four times the width, while the thorax is longer, as are also the antennæ. The eyes are very much smaller. The mandibles are more prominent than in *oryzæ* and the inner tooth is very weak in comparison. In the latter it is strongly developed.

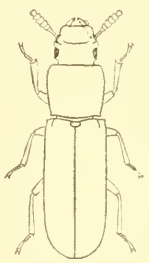


FIG. 3.

It is evident that the dentate apices of the mandibles is a generic character previously overlooked because the mandibles are less prominent in *oryzæ*.

A FEW NOTES ON BRENTHIDÆ.

BY GUSTAV BEYER,

NEW YORK, N. Y.

So far as is known, this family is represented by but six species in our fauna. Some of these are very interesting on account of their abnormal length and extreme slenderness.

Cylas formicarius Fabricius.

This species breeds in sweet potatoes, also a creeping plant closely allied to the sweet potato plant. The creeping plant grows just at high-water mark on the seashore of Florida. During the month of April at Palm Beach, Fla., I discovered that this species was very plentiful under this plant.

Eupsalis minuta Drury.

This is the only species of Brenthidæ which occurs in the vicinity of New York. I have taken it under bark of dead hickory and found it very common in dead gum trees in Virginia.

Trachelicus miamana Bohemann.

I have taken this species in the vicinity of Miami, Elliots Key and Key Largo, Fla., from flowers in May. It seems to be rare. Last summer I collected the last two weeks in June and the first week in July at Key Largo, Fla. I secured only one specimen and found the remnants of another.

Vaseletia vaseleta Bohemann.

This species occurs in gumbo limpa (*Hibiscus esculentus ?*), but does not bore in the stem. It breeds in rotten moist bark, which is often 2½ inches thick. The insect has the same color as the bark and lies as if dead in the moisty stuff.

Taken at Santa Rosa, Lower California, July, 1901.

Brenthus anchorago Linnæus.

The peculiar characteristic of this species consists in its long and slender form. It occurs in Lower California in August; in Jupiter, Fla., and southwards in April and May.

It breeds in gumbo limpa, through which it burrows. I found trees, which were practically filled with this species. It varies greatly in size. Small specimens were described as *Brenthus lutans* Horn.

The error would have been avoided if Dr. Horn had seen a long series of this insect at that time.

Brenthus peninsularis Horn.

This species is erroneously reported to breed in gumbo limpa. During the month of May I took this insect at flowers at San Filipe, Lower California, and I was not able to discover their breeding place. *Brenthus anchorago* came out in August and I examined hundreds of this latter species, but never found one *B. peninsularis* mixed up with them.

Class I, HEXAPODA.

Order IV, DIPTERA.

THE LARVA OF CULEX PUNCTOR KIRBY, WITH NOTES ON AN ALLIED FORM.

By HARRISON G. DYAR, A.M., PH.D.,

WASHINGTON, D. C.

(PLATE IX.)

Culex punctor Kirby, is one of those single-brooded, early developing mosquitoes that would seem especially adapted to an arctic climate. Three-fourths of the year is spent in the egg state. The eggs, lying in marshy places frozen up over winter, hatch as soon as the ice has melted in the spring. The larval stages are passed in about three weeks, even in very cold water and the adults emerge immediately. They may fly possibly for six weeks, when the eggs being laid, they die and the species disappears, apparently, for the season. With these habits the insect ought to occur throughout the arctic circle. I met with it in Canada in the mountains of eastern British Columbia (Proc. Ent. Soc. Wash., VI, 39, 1904). A single fully grown larva, apparently the last one of a brood, was found on May 31. It soon pupated and the imago occurred on June 4. Other mosquitoes were flying at this time over the swamp where the larva was found and were supposed to be of the same species. On being imprisoned, they were fed on sugar and water. After being in confinement for two weeks, a female deposited eggs on the surface of the water. They were kept in water

all the summer and following winter and hatched as soon as the ice melted the following spring. The eggs were laid singly. They are peculiar, being very wide and angularly shaped. They float at first, but soon sink or become adherent to objects at the side of the pool or floating on it.

On rearing the eggs that had hibernated, I was surprised to find that the larvæ differed markedly from *punctor* and were obviously a distinct species, the imagoes of which I had confounded with *punctor*. I have referred to the egg as that of *punctor* (Proc. Ent. Soc. Wash., VI, 39, 1904); this reference should be cancelled. The mature form I have in only very slender material. The original female from which the eggs were obtained is badly rubbed and a male bred by Dr. Dimmock at Springfield, Mass., from an identical larva, is broken. Mr. Coquillett has kindly examined the specimens and does not detect any difference; but he considers the material too poor to form an opinion on. I am inclined to designate this form provisionally as *Culex trichurus*, in order that it may be referred to. The name is given in allusion to the unusually hairy air tube of the larva, since it is the only species of the short-tubed group that has more than a single hair tuft.

EARLY STAGES OF CULEX TRICHURUS DYAR.

Egg. (Plate IX, Fig. 2.)—Thickly fusiform, the ends well tapered, one side more bulging than the other. Black, the surface very finely granular shagreened all over, no sculpturing, no mucilage. Laid loosely, floating, but sinking at the first touch or adhering by surface tension to marginal objects. Length 0.6 mm., width 0.3 mm.

Stage I.—Head rounded, flattened, normal; antennæ moderate, equal, with small spinules, terminal digits and tuft of hair at the middle of the joint, all darkly infuscated. Body moderate, equal, submoniliform, normal; hairs moderate, becoming gradually less posteriorly. Air tube moderate, about three times as long as wide, the basal two thirds colorless, the tip infuscated (Plate IX, Fig. 3); pecten of two rows of flat, dentate plates with long marginal spine (Plate IX, Fig. 4), the single hair arising well within the pecten and nearly at the middle of the tube. Lateral comb of the eighth abdominal segment a row of obscurely digitately spined teeth with central longer spine (Plate IX, Fig. 5) in a single row, parallel, approximate, six, seven or eight in number. Anal segment with a small, rounded quadrate dorsal plate, darkly infuscated; terminal hairs and four anal processes normal; no ventral brush. The body is pigmented in brown over the dorsal region.

Stage II.—Head rounded, flattened, normal, darkly infuscated, the antennæ moderate, uniform, with normal terminal spines and hairs, sparsely spinulose, darkly colored throughout; a small tuft of two hairs at basal third. Body normal, darkly pigmented dorsally; air tube short, about twice as long as wide, abruptly tapered

(Plate IX, Fig. 6), infuscated throughout, the last three pecten teeth stouter and more remotely placed than the basal ones, the single hair tuft arising before the middle of the tube; pecten teeth (Plate IX, Fig. 7) are stout spines with two short basal branches. A double row of small hair tufts on the dorsal aspect of the tube. Lateral comb of the eighth segment consists of seven to nine single, thorn-shaped teeth with finely pectinated bases, arranged in an irregular transverse row (Plate IX, Fig. 8). Anal segment with a small dorsal plate and terminal tuft; ventral brush present, small, arising from a barred area, which is preceded along the ventral line of the segment by small, but distinct hairs. Anal processes four, moderate, not inflated, without conspicuous tracheæ.

Stage III.—As in Stage II. Air tube two and a half times as long as wide, its dorsal hairs forming distinct tufts, the teeth of the pecten exceeding the tuft. Head brown, infuscated; a small tuft at the middle of the antennæ, moderate, brown. Body normal.

Stage IV.—Head brown, infuscated, the antennæ moderate, equal, brown, the small tuft at the middle. Body normal, the hair tufts heavy, with large chitinous plates (Plate IX, Fig. 9), the abdominal ones slight, diminishing posteriorly. Comb of the eighth segment of twelve large thorn-shaped teeth; air tube two and a half times as long as wide, abruptly tapered, the tuft before the middle, followed by large detached teeth of the pecten, with three small tufts below and a double row of hair tufts above. Anal segment not ringed; with distinct tufts before the barred area; anal tuft and brush normal, large. Anal processes four, moderate, not conspicuously tracheate.

Pupa.—As usual in *Culex*.

EXPLANATION OF PLATE IX.

Fig. 1. *Culex punctor* Kirby. Larva.
" 2. *Culex trichurus* Dyar. Egg.
" 3. " " " The air tube of the first stage.
" 4. " " " A pecten tooth of the air tube.
" 5. " " " A spine of the lateral comb of the eighth segment.
" 6. " " " Air tube of the second and third stages
" 7. " " " A spine of the air tube.
" 8. " " " A spine of the lateral comb of the eighth segment, second stage.
" 9. *Culex punctor* Kirby. Thoracic hair tufts, fourth stage.
" 10. " " " Lateral comb of the eighth segment.
" 11. " " " Air tube, fourth stage.
" 12. " " " A single spine of the lateral comb.
" 13. " " " from Brit. Col. A pecten tooth of the air tube.
" 14. " " " from Mass. A pecten tooth of the air tube.

BRIEF NOTES ON MOSQUITO LARVÆ.

By HARRISON G. DYAR, A.M., PH.D.,

WASHINGTON, D. C.

PARTIAL REGENERATION OF ANTENNÆ IN CULEX DYARI COQ. — Dr. Geo. Dimmock sent some *Culex dyari* larvæ from Springfield, Mass., by mail. They were damaged in transit, many being killed, while some of those that survived had lost the antennæ. They were in stage iii and, on molting to the last stage, the antennæ were partly regenerated. The antenna in this species is very long and conspicuous, slightly swollen, white with black base and tip, the outer fourth contracted, bearing a tuft at the contraction, two hairs toward tip and a long and short spine at apex. The regenerated member consisted of an elliptical bladder-shaped organ only about twice as long as wide, spinose, but without any hair tuft or terminal hairs.

OVIPOSITION OF CULEX ATROPALPUS COQ. — I have noted the egg laying of the autumnal specimens of this species (Ent. News, XIV, 180, 1903). In order to test whether there is more than a single brood annually, I secured early larvæ from the pot holes at the Stubblefield Falls of the Potomac. I found the larvæ well grown on May 10. Imagoes began to issue toward the end of May and laid eggs freely within two weeks of emergence. The eggs hatched in three days, showing that there is more than one annual brood. The interesting point observed is that the early eggs are not laid like the late fall ones in patches firmly adhering to the side of the vessel, but loosely and separately, scattered mostly over the surface of the water.

OCCURRENCE OF CULEX AURIFER COQ. — Mr. J. Turner Brakeley writes that the last of the larvæ of this species had completed their transformation in May and no more would be found during the season. He had pupæ as early as April 28. As noted by Smith (Ent. News, XV, 148, 1904), Mr. Brakeley finds the larvæ in a cranberry bog pool held by two dams at right angles to each other, the pool being about sixty feet long by thirty feet wide. He has also found them in a "five boy," an unusual place for mosquito larvæ, since it contains flowing water. A "five boy" is a pit, five by six feet and six feet deep at the foot of a dam of a cranberry bog, into which the water pours before entering the drainage trench. Dr. Geo. Dimmock has collected the larvæ at Springfield, Mass., under the number 2175.

I would note, as corrective of Smith's published figure, that the anal segment is not correctly drawn. It is represented as ringed by the plate, which is not the case.

OCCURRENCE OF CULEX DISCOLOR COQ. — The larvæ occurred on May 18 at Grassymead, Va., near Mount Vernon, in a temporary roadside puddle, in company with *C. jamaicensis, C. restuans* and *Psorophora ciliata*. The puddle was dry a week later. The larva has a peculiar habit of lying on the bottom on its back with the four, stiff anal gills erect and divergent and the mouth brushes fanning continuously.

OCCURRENCE OF JANTHINOSOMA MUSICUM SAY. — The larvæ occurred on May 21 at Grassymead, Va., in a temporary roadside puddle, in company with *Culex sylvestris*. The single larva collected was completely covered with the little stalked Protozoon, *Vorticella*. It pupated, leaving the *Vorticella* attached to the cast skin. The larva is recognizable by its long antennæ. It has a general resemblance to *Culex jamaicensis*.

OCCURRENCE OF CULEX SALINARIUS COQ. — The larvæ were found to be abundant in all stages in a large grassy swamp, near Chesapeake Beach, Md., on June 8. The swamp is within a few rods of the bay, but separated therefrom by a wide strip of sand covered with trees, and is not perceptibly salt. It is overgrown in places with *Lemna* and contains other fresh water organisms. Smith states that the larvæ inhabit salt marshes only, but I think this statement liable to correction. Mr. F. Knab took several larvæ, indistinguishable from *salinarius*, from a rain water barrel at Springfield, Mass., and I have found them in a similar situation at Washington, D. C.

LARVA OF CULEX VITTATUS THEOB. — The adults referred to by me as *Culex cantans* (Proc. Ent. Soc. Wash., VI, 38, 1904) and the larvæ described under the same name (Journ. N. Y. Ent. Soc., XII, 36, 1904) should be referred to *vittatus*. Mr. Coquillett finds that, while very close to *cantans*, they agree with Theobald's description, published since he made the first identification, and with specimens from Theobald's type locality. Unfortunately the figure and description of the larva given by Theobald (Can. Ent., XXXV, 313, 1903) are very unlike mine, especially in the proportions of the air tube, which will necessitate renewed breeding experiments to clear up the contradiction. It seems possible that the larva described by Theobald is not correctly associated. The figure would pass for *Theobaldia incidens*, which species is likewise recorded in the article, but without larval notes.

AS TO CULEX CANTANS MEIG. — This species is a prolific source of confusion. I notice that the dissected larva sent in by Mr. Johannsen, and presumably the original of his figures (Bull. 68, N. Y. State Mus., 420, 1903, pl. 45) is not *cantans*, but *canadensis*. His figures should be cited under *canadensis*, but the character used in the synoptic table (p. 416) is correct for *cantans*. Add to this the confusion noted above between *vittatus* and *cantans* and the two very different larvæ producing apparently indistinguishable adults, noted by Mr. Knab and myself (Proc. Ent. Soc. Wash., VI, 143, 1904).

IDENTITY OF CULEX REPTANS MEIG. — If the European *reptans* (*nemorosus* Meig.) really exists in America, it is the form *trichurus* Dyar, described in this issue of the Journal, to judge by Meinert's figures (Vid. Selsk. Skr., 6, III, 4, Pl. I, figs. 17–19, 1886), and not either of the three forms called *impiger* Walk., *reptans* Meig., and *punctor* Kirby in my paper on British Columbian mosquitoes (Proc. Ent. Soc. Wash., VI, 37, 1904). The four American forms are very closely allied as adults, though the larvæ are distinct enough. *Trichurus* differs from Meinert's figures of *nemorosus* in that the tufts on the tube are more numerous and multiple. Meinert figures but two single dorsal hairs, while *trichurus* has a double row of about six tufts.

WHOLESALE SLAUGHTER. — A large colony of *Culex sollicitans* Walk. hatched on the salt marsh near Noyes Beach, R. I., about June 29, following rain. By July 5, the marsh had gone dry and myriads of dead larvæ were observed. They had gathered in the lowest depressions, and in one wheel rut their bodies covered the ground in a solid mass two inches wide and five or six feet long.

A CASE OF ANEMOTROPISM.* — It may be worth while to place on record the following instance, which was sent me by the Rev. C. C. Carpenter, of Andover, Mass., who under date of April 20, 1896, wrote me as follows:

"A friend was down at Marshfield or Scituate the other day, and sitting on the dunes near the water watched for hours a steady and large stream of small flies going northeast, against the wind, for hours and hours, in perfect order and symmetry. He is curious to know whether they were migrating — or what. I suppose you know." Unfortunately no specimens were sent me, so that the species is unknown. — A. S. PACKARD, Providence, R. I.

* Prof. W. M. Wheeler has noticed this phenomenon in *Bibio* and also in *Chironomus* (Archiv für Entwickelungsmechanik der Organismen, VIII, p. 373, 1899.)

THE EPISTOMAL APPENDAGES OF MOSQUITO LARVÆ.

By FREDERICK KNAB,

URBANA, ILL.

(PLATE X.)

In sorting mixed captures of mosquito larvæ some trouble was experienced, partly on account of the close resemblance of some of the species, but more particularly on account of the considerable variation, not only in color, but also in such characters as the length and form of the antennæ, the breathing-tube, gills, etc. To add to the difficulty, there is more or less of a change with each moult.

The head of the larva bears upon its dorsal surface a number of conspicuous hairs or tufts of hairs. Upon comparison of the different species and their stages, it was found that these hairs existed in all of them. They differed not only in each species examined but also in each of the stages. Three pairs of these hairs or hair tufts are conspicuous appendages of the head and readily available as specific characters. They may consist of single hairs, of two or three hairs with a common base, or of fan-shaped tufts of hairs—each species presenting specific distinctions in the number of hairs in the tufts, as also in their length, coarseness and the relative position. Their bases are inserted into sockets so that they sway about with the motions of the larva. Doubtless they are sensory in function and help to keep the larva in touch with its surroundings. These appendages are all situated upon the epistoma — using that term in the sense of Schioedte and other European writers for the part included within the epicranial sutures. The appendages are arranged upon the area between the antennæ and usually somewhat farther back. However their relative position differs considerably, not only in different species, but also in the different stages. The accompanying diagrams will show these differences in a few forms. In the mature larva of *Culex restuans* the six appendages are in a transverse series, nearly in a line. The innermost pair of these appendages I have called the median pair; the two on the outer sides of these the intermediate pair; the third pair, close to the margin and near the base of antennæ, the outer pair.

In many species the median pair is inserted farther back and sometimes come almost longitudinally into line with the intermediate

pair. Two other pairs of hairs or tufts occur upon the epistoma. Usually they are very small, and in some forms, at least of the mature larva, are absent altogether. One pair is situated farther forward and nearer together than the "median" pair. The other pair is located well back and near the epicranial suture, nearly opposite the eyes. In the first stage these last two pairs of appendages are equally developed with the other three pairs which afterwards become so conspicuous. In the first stage the appendages all consist of single hairs, differing, however, in relative length and position in the different species. One species only, in my experience, is an exception. In the first stage of *Culex triseriatus* the pair of appendages nearest together consist of fine hairs in twos. In the succeeding stages this pair develops into tufts very similar to the outer pair.

The three most highly developed pairs of epistomal appendages, which I have termed the median, intermediate and outer pairs, are present in all the species of *Culex* larvæ that I have examined. The median and intermediate pairs develop very differently in the different species. For example, in *Culex territans* they usually continue as single hairs throughout the four stages, while in *Culex restuans* the number of hairs in each appendage increases with each succeeding stage. The outer pair consists of hairs in tufts in the last stage of all the species I have examined. These tufts also differ in length, coarseness and the number of hairs in the different species. In *Culex cantans*, for example, there are four or five coarse hairs in the tuft, while in *Culex territans* there is an ample fan-shaped tuft of ten or twelve hairs. In the first stage this outer pair of appendages, like the others, is of single hairs. In the second stage these outer appendages usually consist of two hairs, in some cases of three or four, and the number of hairs increases in the third and fourth stages. As one would naturally suppose, these appendages, like other characters, are subject to some variation, but nevertheless are useful in determining species and stages. My experience has been with a limited number of species, but as far as I have gone each species has proved sufficiently distinct in these characters.

The terminology "median," "intermediate" and "outer" pairs of appendages was adopted when my descriptive work was first begun, and has been retained for want of a better one. It is, however, hardly satisfactory.

Other hairs, or groups of hairs, also occur on various other parts

of the head, particularly on the ventral surface. These, too, are differently developed in the different species but no consideration is given them here.

While, as above remarked, variation occurs in the epistomal appendages of the species of mosquito larvæ, those of a particular brood are fairly constant.

EXPLANATION OF PLATE X.

Epistomal appendages of mosquito larvæ.

Fig. 1. *Culex triseriatus* Say, stage I.
" 2. " " " " II.
" 3. " " " " III.
" 4. " " " " IV.
" 5. *Culex territans* Walk., " I.
" 6. " " " " II.
" 7. " " " " III.
" 8. " " " " IV.
" 9. " " " " " variation.
" 10. *Culex restuans* Theob., stage IV.
" 11. *Culex canadensis* Theob., stage IV.
" 12. *Culex pipiens* Linn., stage IV.
" 13. *Culex cantans* Meig., stage IV.

Class I, HEXAPODA.

Order V, LEPIDOPTERA.

A NEW NAME FOR A TINEID GENUS.

BY AUGUST BUSCK,

ST. LOUIS, MO.

Paraclemensia, new name.

Brackenridgia Busck, Proc. Ent. Soc. Wash., V, 193, 1903, not Ulrich, Tr. Amer. Micr. Soc., xxiii, 90, 1902.

Prof. T. D. A. Cockerell has kindly called my attention to the fact that the name *Brackenridgia* used by me for the genus of which *acerifoliella* Fitch (Dyar, Cat. Am. Lep., No. 6477) is the type and at present the only recognized species, is preoccupied in the Crustacea. I am glad to adopt a suggestion from Prof. Cockerell and would substitute the new generic name *Paraclemensia*, thus retaining in the name the tribute to the founder of the study of Microlepidoptera in this country.

TWO NOTES ON TINEID MOTHS.

By HARRISON G. DYAR, A.M., PH.D.,

WASHINGTON, D. C.

DESCRIPTION OF THE LARVA OF ETHMIA LONGIMACULELLA CHAMBERS. — This larva was received at the National Museum from Dr. James Fletcher, Ottawa, Canada, with a memorandum stating that it was bred on *Lithosperma officinale*.

Larva. Head rounded, bilobed, flattened before, rather thick, dull black throughout, the setæ coarse and pale; width 2 mm. Body cylindrical, uniform, rather stout, feet normal, skin smooth. General color purplish black with a few transverse white bands. Cervical shield large, bright orange colored, bisected by a yellowish line, tubercles concolorous. Neck white; sides of joint 2 behind the spiracle white; white bands in the intersegments of joints 3–4, 4–5, 9–10 and 10–11, the two anterior ones rather narrow dorsally, strongly widened below the spiracle, the two posterior nearly uniform in width, none passing to the venter. Tubercles small, black, normal, iv and v united, vii with a dark plate bearing numerous setæ. Feet all ringed with black.

A CASE OF SYNONYMY. — My colleague, Mr. August Busck, described a new genus and species of Tineids as *Dorata virgatella* (Proc. Ent. Soc. Wash., VI, 123, 1904), from Arizona, placing the genus in the Œcophoridæ. Having occasion to look over Lord Walsingham's description of *Pterolonche lineata* (Insect Life, I, 284, 1889), I was at once struck by the similarity to Mr. Busck's species, and a comparison convinces me that they are the same. The very peculiar ♂ genitalia of *virgatella* agree well with Lord Walsingham's description of those of *lineata*. Lord Walsingham placed the species in Zeller's genus *Pterolonche* in the Yponomeutidæ. Unfortunately I have no specimens of this genus, but it appears not improbable that Mr. Busck's genus *Dorata* will prove a good one. Unless the contrary be shown when specimens are at hand, the forms will be listed thus:

Dorata Busck.
lineata Walsingham.
virgatella Busck.
inornatella Busck.

The genus falls in the Œcophoridæ rather than the Yponomeutidæ by Meyrick's tables, as Mr. Busck states.

Class I, HEXAPODA.

ORDER XI, ORTHOPTERA.

ON A COLLECTION OF NON-SALTATORIAL ORTHOPTERA FROM PARAGUAY.*

By A. N. CAUDELL,

WASHINGTON, D. C.

For several years I have been receiving from Mr. W. T. Foster, of Sapucay, Paraguay, numbers of Orthoptera taken by him within a radius of ten miles of Sapucay. The U. S. Department of Agriculture purchased about one thousand specimens from Mr. Foster and the U. S. National Museum has acquired several hundred specimens from the same source. These three collections are now deposited in the National Museum and form the subject of this paper.

It was my original intention to prepare a complete faunal treatise on the Orthoptera of Paraguay but the lack of general collections from various portions of that republic makes that impractical at this time. I therefore present the following as a contribution to the knowledge of the Orthoptera of Paraguay. In subsequent papers I hope to treat of the saltatorial forms represented in these collections.

In the identification of these specimens I have been aided by the works of Giglio-Tos and Brancsik, those of the former being especially valuable as forming a list from which to work.

A comparison of the species here treated with those recorded in the various articles by Giglio-Tos in Boll. Mus. Torino shows the fauna of the region about Sapucay to be quite different from that of certain other portions of Paraguay. The country surrounding Sapucay is described by Mr. Foster in a letter under date of May 14, 1902. The following is quoted from this letter:

"Sapucay is a small village situated at the base of a low table land the elevation of which is 800 feet above the surrounding country. * * *

* During the coming year I hope, with the coöperation of Dr. H. G. Dyar, to promulgate a system of nomenclature with the hope of securing a comparatively stable basis. Then a revised nomenclature will be adopted, in some cases agreeing with the results arrived at by Krauss and others and in other cases radically different. But for the present the old nomenclature is used.

The tend of the face of the table land is northwest and southeast. The country to the southwest and east is generally level, broken by low hills rising abruptly from the plains, which extend to the level cattle breeding lands of the Missions, which in turn gives place to the low swamp land of the southwest corner of Paraguay, which, with the exception of a narrow fringe along the rivers Paraguay and Alto Parana, is given over to the anaconda and tiger (jaguar). I was several months down there collecting water birds but do not have any very pleasant recollections of the district. Periodical floods extend for leagues inland, filling up the swamps which in turn extend for miles; patches of forest from a few hundred feet to a mile in diameter occupy any land rising a few feet above the swamp. A few wandering tribes roam the large forests of the Alta Parana but the rest is a desolate waste.

"I do not find that the table land mentioned above bears a different fauna than that of the low lands, nearly all specimens taken by my collecting boys on the higher lands being duplicated by others from the plains.

"The winter is now about commencing and the frost during the months of June and July is somewhat severe, with the result that insects are correspondingly scarce. I therefore do but little collecting during the winter months but turn my attentions to bird and mammal skinning."

The total number of non-saltatorial specimens sent in by Mr. Foster is 105, comprising 27 species: 3 Forficulidæ, 12 Blattidæ, 7 Mantidæ and 5 Phasmidæ.

Family FORFICULIDÆ.

Anisolabis azteca Dohrn.

Forcinella azteca Dohrn, Stett. Ent. Zeit., xxiii, 226, 1862.
Anisolabis azteca Scudd., Proc. Bost. Soc. Nat. Hist., xviii, 302, 1876.
Anisolabis antennata Kirby, Journ. Linn. Soc., xxiii, 517, 1891.
Anisolabis bormansi Scudd., Bull. Mus. Comp. Zool., xxv, 5, pl. 1, fig. 1, 1893.
Anisolabis azteca Bormans, Das Tierr., ii, 49, 1900.

Two males without date. These specimens are exactly similar to the type of *bormansi* except that the forceps are strongly incurved apically, as is often the case with male specimens, and the antennæ have segments 11 and 12 pale in one while in the other the right antenna has segments 12 and 13 pale and the left one segments 13 and 14. Most species with certain ones of the antennal segments pallid

exhibit more or less variation in this respect. Besides these two specimens from Paraguay and the type of *bormansi* from the Galapagos Islands, the National Museum contains specimens of this species from California, Arizona and Florida in the United States and from Porto Rico in the West Indies. The synonymy of *bormansi* with *azteca* is based upon a study of the above material. The United States specimens were identified several years ago by Prof. Scudder who critically examined them at my request. He pronounced them to be *azteca* and did not attempt to refute my statement that they were specifically similar to the type of his *bormansi*. These United States specimens are females and measure 11.5 to 13.5 mm. in length exclusive of the forceps, and the banding of the femora and the number of pallid segments of the antennæ are quite variable. In both size and coloration these two forms intergrade and I feel safe in the establishment of their synonymy. The identity of Kirby's *A. antennata* from Bermuda with *azteca* was pointed out by Bormans.

Immature specimens of some species of *Psalis* bear a strong resemblance to certain apterous species of this genus and a careful study is often necessary to separate them.

Labia paraguayensis, new species.

Female. Brown, paler below; legs pale yellowish. Antennæ 11 to 12 jointed, brownish, unicolorous. Pronotum scarcely as broad as the head, subquadrate, slightly broader than long, the lateral borders very thin. Elytra slightly longer than the pronotum, unicolorous; wings aborted. Abdomen flattened, broad, widened in the middle, the third and fourth segments of the female with lateral folds, the fourth segment of the male similarly furnished. Forceps of the female moderately stout, triquetrous, contiguous at the base, slightly curved, especially at the tip where the points cross a little when the forceps are closed; inner margin straight to near the tip and with several dull unequal serrations, contiguous to the tip when closed; forceps of the male subcylindrical, moderately and quite uniformly incurved, widely separated at the base and armed on the inner edge at the middle of the apical half with a small tooth and at the middle of the basal half with an angular projecting shoulder, small but distinct. Pygidium of the male prominent, quadrate, the truncate tip slightly notched at each side.

Length, exclusive of the forceps, ♂ and ♀, 7.5 mm.; forceps, ♂, 2.25 mm., ♀, 1.75 mm.

Two females, February; one female, one male, no date.

Type. — No. 8025, U. S. National Museum.

Apterygida linearis Eschscholtz.

Forficula linearis Esch., Entomogr., i, 81, 1822.
Forficula tæniata Dohrn, Stett. Ent. Zeit., xxiii, 230, 1862.

Apterygida tæniata Borm., Das Tierr., ii, 110, 1900.
Forficula luteipes Scudd., Proc. Bost. Soc. Nat. Hist., xviii, 255, 1876.
Sphingolabis tæniata Borm., Biol. Cent.-Amer., Orth., i, 12, pl. 2, figs. 17–19, 1893.
Apterygida linearis Rehn, Proc. Acad. Nat. Sc., Philad., 1903, 310, 1903.

Seven females, November; four males, one female, no date.

The employment of Eschscholtz's old name for this common and widely distributed species brings up the question of whether absolute identification is necessary to justify the resurrection of old unidentified specific names for species more recently characterized. Personally I am of the opinion that it is justifiable, for it seems better to utilize old identified names for known species even at the expense of a few recent names than continue them as meaningless terms or included in doubtful synonymy. The one essential thing to be observed, and one to be insisted upon, is that no such application of an old unidentified name to a known species shall be made when the description or diagnosis of the old species differ in any particular from the characters exhibited by the known species to which the old name is applied. I therefore employ here the name *linearis* instead of the more recent *tæniata* as has already been done by Mr. Rehn.

Family BLATTIDÆ.

Anaplecta albomarginata Saussure & Zehntner.

Anaplecta albomarginata Sauss. & Zehnt., Biol. Cent.-Amer., Orth., i, 26, 1893.
Anaplecta albomarginata Giglio-Tos, Boll. Mus. Torino, xv, No. 377, 1, 1900.

One female, November.

Anaplecta lateralis Burmeister.

Anaplecta lateralis Burm., Handb. Ent., ii, 494, 1838.
Anaplecta lateralis Giglio-Tos, Boll. Mus. Torino, ix, No. 184, 1, 1894.
Anaplecta sosia Sauss., MS.

One female, October.

The type of *A. sosia* Sauss., apparently undescribed, is in the National Museum from Costa Rica. It is mentioned as a new species by Biolley in Tomado, del informe del Museo Nacional, 43, 1900, but no reference is given. It does not seem to differ specifically from this specimen from Paraguay.

Kakerlac borellii Giglio-Tos.

Loboptera borellii Giglio-Tos, Boll. Mus. Torino, xii, No. 302, 3, 1897.

One female, February.

Ischnoptera brasiliensis Brunner.

Ischnoptera brasiliensis Brunn., Nouv. Syst. Blatt., 130, 1865.
Ischnoptera brasiliensis Giglio-Tos, Boll. Mus. Torino, xv, No. 377, 2, 1900.

Seven males, February, September and October.

This species is very closely allied to *I. uhleriana* Sauss., and may be but a form of that species. The females of all the species of this genus are apparently much scarcer than the males.

Ischnoptera vilis Saussure.

Ischnoptera vilis Sauss., Rev. Mag. Zool., xxi, 112, 1869.

Six males, December to May.

Blattella borellii Giglio-Tos.

Phyllodromia borellii Giglio-Tos, Boll. Mus. Torino, ix No. 184, 2, 1894.

One male, March.

This imperfect specimen, lacking the body and most of the legs, seems to agree fairly well with the description of this species except that the femora are black and the elytra measure but 7.5 mm. in length.

Blattella conspersa Brunner.

Phyllodromis conspersa Brunn., Nouv. Syst. Blatt., 106, 1865.

One male, no date.

This species is somewhat smaller than *B. brunneriana*, which has been recorded from Paraguay. These two species may prove to be the same.

Blattella germanica Linnæus.

Blatta germanica Linn., Syst. Nat., ed. xii, ii, 688, 1766.
Phyllodromia germanica Brunn., Nouv. Syst. Blatt., 90, fig. 7, 1865.
Blattella germanica Caudell, Proc. Ent. Soc. Wash., v, 234, 1903.
Phyllodromia bivittata Serv., Orth., 108, 1839.

Two males, October; one female, February.

Some orthopterists consider *bivittata* Serv. as distinct from *germanica* Linn. but from a study of specimens from the United States, Porto Rico, Mexico and South America, I find the venation of the wings offers no constant character for their separation.

This species has been mentioned from Paraguay in several papers.

Nyctibora confusa Giglio-Tos.

Nyctibora confusa Giglio-Tos, Boll. Mus. Torino, xii, No. 302, 8, 1897.

One female February.

This species was recorded by Giglio-Tos in various papers on the Orthoptera of Paraguay under the name *M. holosericea* Burm.

Panchlora nivea Linnæus.

Blatta nivea Linn., Syst. Nat., ed. x, i, 424, 1758.
Panchlora nivea Brunn., Nouv. Syst. Blatt., 274, 1865.
Panchlora nivea Giglio-Tos, Zool., Jahr., viii, 805, 1895.

Three males, two females, October to March.

Panchlora thalassina Saussure and Zehntner.

Panchlora thalassina Sauss. and Zehnt., Biol. Cent.-Amer., Orth., i, 93, 1893.

One male, one female, February.

The species of this genus are quite closely allied to each other and I believe that some synonymy may be expected among them.

Latindia sp.?

The collection contains one male specimen, which is unfortunately in such poor condition as to permit of only a doubtful generic determination.

Family MANTIDÆ.

Mantoida brunneriana Saussure.

Chætessa brunneriana Sauss., Mem. Mex., iv, 14, 1871.
Mantoida brunneriana Westw., Synop. Mant., 1, 1889.

One male nymph, March.

Musonia livida Serville.

Thespis livida Serv., Orth., 172, 1839.
Musonia livida, Westw. Synop. Mant., 6, 1889.

Three males, January, February.

These specimens agree very well with the original description of Serville. The specific characters there given, together with the generic characters exhibited by the specimens themselves, make me quite sure of the correctness of the determination. The borders of the prothorax in these specimens are very finely serrate and one specimen is of an obscure greenish color. The exact measurements are as follows:

Total length, 34 mm.; anterior femora, 8 mm.; anterior tibia, exclusive of the apical spur, 3 mm.; intermediate femora, 8.5 mm.; posterior femora, 12 mm.; elytra, 25 mm.; wing, 23 mm.; cerci, 3 mm.; supra-anal plate, 3 mm.; width of supra-anal plate at the base, 1 mm.

The genus *Musonia* has a superficial resemblance to *Oxyops*,* but structurally it falls into quite a different group.

*The genus *Oxyops* of Saussure, described in 1869, is preoccupied by *Oxyops* Schonh., a genus of Coleoptera described in 1826. For the orthopterous genus I propose the name *Oxyopsis*.

Coptopteryx argentina Burmeister.

Mantis argentina Burm., Berl. Ent. Zeitschr., viii, 238, 1864.
Coptopteryx argentina Sauss. Bull. Ent. Suisse, iii, 66, 1869.
Coptopteryx argentina Westw., Synopsis Mant., 6, 1889.

Five males, five females, December to March.

The males exhibit some variation in size, one measuring but 43 mm. in length of elytra and the pronotum is only 16.5 mm. long. But the shape and venation of the wings of this small specimen shows it to belong to this species. Two of the large specimens exhibit venational variation in that the wing in the first and second axillaries of one merge 8.5 mm. from the tip, while in the other specimen the merging of these veins occurs at a point 24 mm. from the tip of the wing, the latter distance apparently the normal one.

Brunneria brasiliensis Saussure.

Brunneria brasiliensis Sauss., Bull. Ent. Suisse, iii, 240, 1870.
Brunneria brasiliensis Sauss., Mem. Mex., iv, ii, 135, pl. ii, figs. 31, 31a, 1871.

Six males, four females, October to March.

This has been reported from Paraguay, but seems not to have been observed recently.

Cardioptera vitrea DeHaan.

Cardioptera vitrea DeHaan, Bijdr. Orth., 82, 1842.
Cardioptera vitrea Westw., Rev. Mant., 15, pl. iv, fig. 7, 1889.

Eight males, October to February.

The males of this genus, not having the tibiæ carinate, often cause more or less confusion in the use of generic tables and are apt to be wrongly placed.

Acontista bimaculata Saussure.

Acontista bimaculata Sauss., Bull. Ent. Suisse, iii, 229, 1870.
Acontista bimaculata Giglio-Tos, Boll. Mus. Torino, ix, No. 184, 3, 1894.
Acontista bimaculata Giglio-Tos, Zool. Jahr., viii, 805, 1895.

Five males, October to March.

This handsome little species is somewhat variable in color, some being quite green and others brownish.

Acanthops sinuata Stoll.

Mantis sinuata Stoll, Spectr., pl. 4, fig. 14, 1787.
Acanthops sinuata Westw., Rev. Mant., 24, 1889.
Acanthops sinuata Giglio-Tos, Zool. Jahr., viii, 806, 1895.

Two males, six females, November to February; six nymphs, January to March.

The elytra of these females measure less than 25 mm. in length, and their abdomens are more ampliate than shown in the figure of Charpentier and Serville, being 15 mm. across the widest part. The bright colors of the wings and abdomen shown in the figures of Charpentier are absent in the dried specimens before me.

Family PHASMIDÆ.

Anisomorpha borellii Giglio-Tos.

Anisomorpha borellii Giglio-Toss, Boll. Mus. Torino, xii, No. 302, 16, 1897.
Anisomorpha crassa Giglio-Tos (not Blanch.), Boll. Mus. Torino, ix, No. 184, 4, 1894; Zool. Jahr., viii, 806, 1895.

Two females, January and March.

The wing pads are very small and in dried specimens the yellow bands of the antennæ are usually obscured.

Olcyphides lateralis Fabricius.

Mantis lateralis Fabr., Ent. Syst., ii, 15, 1793.
Phocylides lateralis Giglio-Tos, Zool. Jahrs., viii, 806, 1895.

One male, February.

In dried specimens the costæ of the wings and the short elytra are of an obscure yellowish color.

Bacunculus dubia, new species.

Female.—Color of dried specimen greenish; head longer than the pronotum, slightly less than one half as long again as broad, unarmed; antennæ with more than fifty segments, more than twice as long as the anterior femora, first segment much flattened, broadened, about twice as long as broad, second rounded, scarcely twice as long as broad, third more slender, cylindrical and several times as long as broad. Body unarmed; prothorax scarcely twice as long as broad and marked dorsally with a cruciform depression; mesothorax nearly six times as long as the pronotum, cylindrical, not swollen at the insertion of the legs; metathorax similar to the mesothorax but a third shorter. Abdomen slender, gradually tapering to the last segment, which is less than one half as broad basally as the first segment: all the segments twice as long as broad and none noticeably expanded; operculum small, passing but little the apex of the eighth segment. Cerci long and slender, twice as long as the apical segment of the abdomen. Legs short and relatively stout, unarmed; first segment of the tarsi longer than the remainder together.

Total length 66 mm.; head, 4 mm.; pronotum, 2.5 mm.; mesonotum, 15 mm.; metanotum, 9 mm.; abdomen, 31.5 mm.; cerci, 4.5 mm.; antennæ, 40 mm.; anterior femora, 15 mm.; intermediate femora, 10 mm.; posterior femora, 12.5 mm.; anterior tibiæ, 14 mm.; intermediate tibia, 9 mm.; posterior tibia, 12.5 mm.

One female, February.

Type.— No. 8027, U. S. National Museum.

I have compared this specimen with descriptions or specimens of all the species from South America known to me, and find it to agree with none of them.

Paraleptynia, new genus.

I find it necessary to characterize a new genus for a somber-colored and uninteresting-appearing phasmid contained in the collection. It is a member of the subfamily Clitumninæ, slender of form, wholly unarmed and related to my genus *Parabacillus* and the closely related *Leptynia* of Pantel. It is apparently more nearly added to the latter, hence the above name. It is readily differentiated from both the allied genera by the antennæ, which, at least in the male, the female at present unknown, is about two thirds as long as the anterior femora and composed of distinct segments. The terminal segment of the abdomen is apically concave and hollowed out below, the cerci round and differing from both *Parabaccilus* and *Leptynia* by having no basal thorn.

This genus is apparently related in some respects to section "b" of the Bacillid subgenus *Baculum* of Saussure* based on *B. ramosus*, an insect of uncertain habitat. But the unarmed head and non-ampliate limbs prove its distinctness.

Paraleptynia fosteri, new species.

Male. Color of dried specimen, light brownish. Head longer than the prothorax, twice as long as broad, unarmed; antennæ with 18 segments, 1 twice as long as broad, basally depressed; 2 about as long as broad, half the length of 1, cylindrical; 3 nearly twice as long as 1 and 2 together; 4 about half as long as 3; the succeeding ones of approximately the same length as number 3, except the last three which are scarcely twice as long as broad, except the apical one which is slightly more, due however to its smaller size rather than absolute length. Body unarmed; pronotum scarcely twice as long as broad, divided by a mesial transverse impression and furnished on the anterior half with three longitudinal furrows; mesothorax six times as long as the prothorax, cylindrical, but little swollen at the insertion of the legs; metathorax similar to the mesothorax but somewhat shorter; median segment not indicated. Abdomen cylindrical, segments one to six about three times as long as broad, the ast three segments subequal, about twice as long as broad, the seventh and eighth, slightly swollen at their proximate ends, the apical segment carinate dorsally, slightly tapering and posteriorly angularly incised, the lateral angles curved inwards as obscure teeth and bordered with minute black denticles. Cerci moderately short, cylindrical, projecting obliquely downwards and bent slightly inwards at the tips, not

* Mel. Orth., II, 112, 1870.

extending beyond the tip of the abdomen. Legs long and slender, unarmed, the genicular angles somewhat prominent; tarsi with the first segment longer than the others taken together.

Entire length, 78 mm.; length, head, 4 mm.; prothorax, 3 mm.; mesothorax, 18 mm.; metathorax, 15 mm.; abdomen, 38 mm.; antennæ, 20 mm.; anterior femora, 31 mm.; intermediate femora, 21 mm.; posterior femora, 23 mm.; anterior tibia, 31 mm.; intermediate tibia, 22.5 mm.; posterior tibia, 27 mm.; cerci, 1 mm.

One male, February.

Type.—No. 8026, U. S. National Museum.

Ceratiscus laticeps, new genus and species.

A large female Phasmid, taken on Jan. 27, apparently represents a new genus and species. It belongs to the subfamily Clitumninæ, but, unlike the other members of that group, it is a large insect with very elongate operculum. The antennæ are short, being considerably less than one half as long as the anterior femora, and consist of twenty distinct segments; the first subquadrate and flattened, the second nearly round, the third twice as long as broad, the following two or three transverse and closely united, and the remainder longer than broad, the terminal eight or nine being twice or more than twice as long as broad. The head is very broad, nearly as broad as long, much broader than the thorax and smooth, except two small round depressions on top, behind and between the bases of the antennæ. Pronotum scarcely twice as long as broad, with a transverse impression, borders emarginate; mesonotum and metanotum unarmed, the former more than six times as long as the pronotum, the latter somewhat shorter, being but five times the length of the pronotum. Intermediary segment not clearly indicated. Body smooth. Operculum as long as the basal four segments of the abdomen. Cerci short and pointed, convex on the inner side. Legs moderately slender; anterior femora strongly curved basally and dorsally, serrated with strong teeth; tibiæ unarmed; intermediate femora and tibiæ armed with a single angular lobe near the base, above on the tibiæ and below on the femora;* posterior legs armed as the intermediate, all the lobes being scarcely higher than the width of the limbs bearing them. All the tarsi have the basal segment longer than all the rest taken together.

Entire length, exclusive of the operculum, 123 mm.; head, 6 mm.; prothorax, 4 mm.; mesothorax, 27 mm.; metathorax, 20 mm.; abdomen, 66 mm.; cerci, 1 mm.; operculum, from the point of attachment to the tip, 35 mm.; anterior femora, 31 mm.; anterior tibiæ, 38 mm.; intermediate femora, 27 mm.; posterior femora, 23 mm.; width across widest part of the head, 5 mm.; of pronotum, 3 mm.

Type.—No. 8102, U. S. National Museum.

In many ways this species resembles the *Bacteria clinteria* of Westwood, and it may, upon comparison with the type of that species, prove identical with it. But I scarcely think so, as it differs from the figure and description of that insect in having the head proportionately much broader and by having the middle and posterior legs with angularly lobate femora and tibiæ.

* One of the tibiæ lacks the lobe.

JOURNAL

OF THE

New York Entomological Society.

Publishes articles relating to any class of the subkingdom Arthropoda, subject to the acceptance of the Publication Committee. Original communications in this field are solicited.

Editorial.

In the Preface to Volume IV of the "British Lepidoptera," Mr. J. W. Tutt expresses his disapproval of the method of selecting types of genera used by Rothschild and Jordan in their "Revision of the Sphingidæ." We at first took this view as well. As Mr. Tutt expresses it, the method appears "easy if not scientific," and he makes out a plausible case for the method of subsequent restrictions. In fact, considered theoretically, this method seems the only logical one. Yet, after studying the subject, we find ourselves converted to Rothschild and Jordan's views. The objection to the method of the "Merton rules" is that it does not work in practice. Mr. Tutt admits that it can only be used by "one who knows," and this is an admission of our contention, expressed in the June issue of this journal* that the method requires a complete knowledge of all the literature. Mr. Tutt does not seem to appreciate that in many cases no one has this knowledge, and even if so there are so many possible interpretations to the actions of subsequent authors that a fatal objection hereby arises to the method. We must have something practical that can be applied by every student. The method of first species seems to promise this, and we therefore favor it.

It cannot be called a new method. It is credited by Mr. T. S. Palmer† to the "Stricklandian Code" of 1842. In 1868 Mr. W. F. Kirby‡ regarded it as an axiom that where no figure or other indication

* Journ. N. Y. Ent. Soc., xii, 120, 1904.

† Dept. Agr., Div. Biol. Surv., N. A. Fauna, No. 23, Index generum mamalium, pp. 19–23, 1904.

‡ Proc. Ent. Soc. Lond., 1868, xliii.

of type was given, the insect placed at the head of the genus was to be considered as the type, and that the first section of a genus always was to be considered typical. Mr. H. W. Bates stated that Professor Westwood had many years ago expressed the view that where an author has by means of dissections, figures or in any other way, indicated the particular species which he regards as typical of this genus * * * that species is of course the type * * *; but where no such indication is given by the founder, the first species in the genus is to be taken as the type and ought to be so taken in any subsequent dismemberment or division of the genus. The idea was combated then on much the same lines as at present. Mr. Bates goes on to say that he doubted whether there was any such rule as Mr. Kirby stated, and that if it were adopted for the future it ought not to be applied to the past. The adoption of such a rule retrospectively would cause so much confusion that the remedy would be worse than the disease, since it would cause the subversion of established nomenclature. In the following discussion Mr. Pascoe thought the type species should be the most prominent one, either by its size, abundance or any other circumstance. He also showed that the old authors did not themselves regard their first species as typical. Mr. Dunning thought that every means thould be used to get at the author's idea, using evidence either "intrinsic or extrinsic, positive or negative," and that the species best embodying this idea was the type. But where no indication can be found, he agreed with the general sentiment of the members present that in the division of a genus, the author who divides it has a right to determine to which division the original name shall be restricted, and that the original name must be retained for some section. The Entomological Society of London proceeded then to endorse the view at present embodied in the "Merton rules" and the "A. O. U. Code."

It appears to us that all these objections disappear. Complaint of change of long established names can no longer be made when every new work changes most of them, on whatever rules it is based. If the first species is sometimes atypical, it is not more so than the type often arrived at by the method of residues. The great advantage is that our method is easy, it promises permanence, in that independent students may arrive at the same result, and it will not condemn an author to spend most of his time in the unprofitable study of ancient history.

In the Entomological News for June Dr. J. B. Smith and

Professor F. M. Webster have some remarks on this subject. Dr. Smith adds nothing in the way of positive suggestion, though he reiterates his objection to the method of first species without giving any reasons. We would only remark that if Dr. Smith had taken the trouble to read his Systema Naturæ he would not have made the inaccurate statement that Linnæus divided the Lepidoptera into *Papilio*, *Sphinx*, *Bombyx*, *Noctua*, etc. Linnæus divided the Lepidoptera into three genera only, *Papilio*, *Sphinx* and *Phalæna*. The other terms are subgeneric, and while we hold that they should probably be raised to generic value, we would note that the action of the students of the butterflies is inconsistent with that of students of the moths. Linnæus' *Papilio* has subgeneric divisions as well as *Phalæna*, which have not been, but should be used.

Professor Webster writes at some length. Eliminating a good deal of conversational matter and some irrelevant remarks of a facetious nature, his contention seems to be that corrections of nomenclature should not be accepted at once, but await verification. This appeals to us as a sensible suggestion. The question arises as to what constitutes verification and how long must these proposed corrections wait. This may be settled by the use of the latest catalogue. It is customary, in all countries where active entomological work is going on, to issue a standard catalogue or list at intervals, and we advise entomologists to use the names given in the latest catalogue till the new one appears. In America, Grote's list of 1882 was used for ten years. Smith's of 1891 replaced it, and was lately superceded by Bulletin 52, U. S. National Museum. Let all working entomologists follow this for the next ten years and not trouble themselves about changes, which can, of course, be proposed in the journals, and wait to ripen for the next general revision of the list. We refer to the ordinary use of names, more especially in economic work, and do not wish to be understood to say that actual errors in the synonymy of species should be perpetuated. Thus the boll worm may continue to be called *Heliothis armiger* instead of *Chloridia obscura*, since the change depends upon a recent idea of generic limitation combined with the resurrection of an old specific name; but *Epelis faxonii* should not be retained as a synonym of *E. truncataria** as this erroneous synonymy was due only to a clerical error in marking the manuscript for the printer.

* See E. J. Smith, Ento. News, xv, 221, 1904.

Professor V. L. Kellogg, of Stanford University, requests us to say that he will spend the coming academic year on leave of absence in Europe. Personal letters will be forwarded. Requests for reprints of papers or for specimens, etc., should be addressed, to avoid delay, to the Department of Entomology, Stanford University, California.

PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY.

MEETING OF MARCH 15, 1904.

Held at the American Museum of Natural History. In the absence of the president the vice-president, C. W. Leng, presided with fourteen members and twelve visitors in attendance.

On motion of Mr. Weeks the by-laws were suspended and the lecture preceded the regular order of business.

The members and visitors had the pleasure of listening to a most interesting and instructive lecture on the "Mosquito and its Relation to Malaria," by Dr. J. B. Smith, State Entomologist of New Jersey. Numerous slides were shown to illustrate the subject.

On motion of Mr. Weeks the Society tendered a vote of thanks to Dr. Smith for his lecture.

Under the regular order of business the librarian reported the receipt of the following exchanges:

Allgemeine Zeits. f. Entomologie, Vol. IX, Nos. 1 and 2.

Wiener Entomol. Zeitung, Vol. XXXVI, No. 3.

Canadian Ent., Vol. XXXVI, No. 3.

Proceedings U. S. National Museum, Vol. XVII, Nos. 1360, 1361, 1362, 1363, 1364.

Horæ Societatis Ent. Rossicæ, Vol. XXXVI, Nos. 3 and 4.

Bull. de la Soc. Impériale de Naturaliste de Moscow, 1902, No. 4.

Mr. Leng, chairman, presented a letter from the editor of the JOURNAL as the report of the publication committee.

Mr. Weeks presented a report from the committee appointed to arrange for the printing of the list of members of the New York and Brooklyn members.

On motion of Mr. Davis the report was accepted and turned over to the publication committee for action.

H. G. BARBER,
Secretary.

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35. Goldhorn, Ludwig B., Bellevue Hospital, Medical College. Diseases of Lepidopterous larvæ. Br. Soc.

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89. Watson, Frank E., 972 E. 168th St., N. Y. City. Lepidoptera. N. Y. and Br. Socs.

90. Weeks, A. C., 30 Broad St., N. Y. City. General collection, Coleoptera and Lepidoptera. N. Y. and Br. Socs.

91. Weiss, Michael, Middle Village, Long Is., N. Y. Br. Soc.

92. Wunder, Charles, 500 E. 83d St., N. Y. City. Lepidoptera. N. Y. Soc.

93. Zabriskie, Rev. J. L., 28 Regent Place, Flatbush Station, Brooklyn, N. Y. Coleoptera, Hymenoptera. N. Y. and Br. Socs.

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Class I, HEXAPODA.

Order II, COLEOPTERA.

NEW GENERA AND SPECIES OF COLEOPTERA.

By Charles Schaeffer,

Brooklyn, N. Y.

The following descriptions and notes are published in advance of a list of the Coleoptera known to occur in the lower Rio Grande Valley on which I have been at work; but have postponed its publication on account of the possible addition I may secure on my second trip to this interesting region. A few notes and descriptions of beetles from other regions are added.

Calosoma dietzii, new species.

Form of discolor, deep black, the reflexed elytral margin, base and sides of prothorax with a bluish reflection. Head sparsely punctate and very feebly rugose, epistomal impressions deep, causing a slight convexity of the front; labrum angularly emarginate, rugose and impressed; mandibles stout, faintly rugose; antennæ nearly as long as the head and thorax, the outer joints at sides glabrous at base. Prothorax not quite twice as wide as long, widest before the middle, sides arcuate anteriorly, becoming nearly straight posteriorly, hind angles broadly arcuate and produced posteriorly, base slightly arcuate-truncate, apex broadly emarginate, with a broad, flattened, impunctured bead; disk moderately convex, basal angles feebly impressed and slightly reflexed, surface very feebly rugose, finely and sparsely punctate, the punctures larger at sides, coarser and more confluent in the basal region, median line fine. Elytra oval, not quite one half longer than wide, very little wider than the thorax in its widest part, sides slightly arcuate, margin evenly and narrowly reflexed and coarsely rugosely punctate with a few granules intermixed; disk convex, striæ composed of fine, feebly impressed punctures, punctuation of intervals finer and sparser; surface smooth. Length, 15–18 mm.; width, 7–8.5 mm.

Tulare Co., California. Two males and two females in coll. Dietz which were mixed with typical *latipennis*.

This is the species referred to as *latipennis* by Major Casey in the remarks following the description of his *arcuata*.* The true *latipennis* has a narrower thorax, similar to *luxatum*, different form of elytra, the humeri serrate and the elytral margin more narrowly reflexed near base than at apex.

C. dietzii is best placed near *discors*, which it more resembles than *latipennis*.

Languria apicalis, new species.

Elongate, red, legs, except femora at base, and elytra metallic green, antennæ and the last abdominal segment black, elytra sinuate before the sutural angles. Head red, not coarsely punctured; antennæ black, basal joint reddish, club five jointed. Thorax longer than wide, sides slightly arcuate, hind angles acute, basal foveolæ short but distinct, punctuations finer at sides than on the disk, not coarse nor closely placed. Elytra punctate striate, intervals smooth, with a row of very fine scarcely visible punctures, obsolete in some specimens, slightly narrowing to apex, sinuate before the sutural angles. Body beneath and femore at base red, the rest of the legs metallic green, last abdominal segment black, which is more densely punctured than the rest of the underside. Length, 8–10 mm.

Brownsville, Texas.

Seven specimens, two in the collection of the Brooklyn Museum and five in the National Museum in Washington.

Type. — No. 8156, U. S. National Museum.

This is very distinct from any of the described species by the sinuate elytral apices. In one specimen, collected by C. H. T. Townsend the sinuation is very strongly marked. The thorax differs in shape as usual in this genus, in some specimens the sides are nearly parallel, while in others they are slightly arcuate and feebly sinuate before the hind angles. A specimen collected by Mr. Schwarz has the elytra blue and the thorax broader and more narrowed in front but does not differ otherwise.

SYNOPTIC TABLE OF LANGURIA.

Abdomen in great part red.
 Head red.
 Antennal club distinctly 6-jointed.
 Underside red, last abdominal segment black; thorax red, usually with a large black discoidal spot..*bicolor* Fab.

* Annals N. Y. Acad. Sci., Vol. ix, p. 343.

Antennal club 5-jointed.

The last abdominal segment black, apex of elytra before the sutural angles sinuate..... *apicalis* n. sp.

Last 3 abdominal segments black, elytra at apex rounded, not sinuate.

Thorax shining, unicolorous red..... *mozardi* Lat.

Thorax alutaceous, having a greasy aspect, with a large elongate black discoidal blotch *discoidea* Lec.

Head either entirely or in great part black.

Seventh antennal joint not very abruptly broader than the sixth and very much smaller than the ninth, tarsal joints more elongated, femora and tibiæ beneath asperate in the males, smooth in the females, thorax reddish, with a darker cloud at middle, sometimes absent, front of head above and beneath reddish..... *tædata* Lec.

Seventh antennal joint very abruptly broader than the sixth and much produced within, femora and tibiæ smooth beneath in both sexes.

Metasternum blue.

Last abdominal segment black, epipleuræ from base to nearly to apex red, head and last abdominal segment black, legs blue except femora at basal half and tibiæ at apex red, tarsi black, thorax red with a black spot at middle.....*marginipennis* Schwz.

Last 2 abdominal segments black.

Epipleuræ and sides of elytra only at middle red.

angustata Beauv.

Metasternum red.

Last 2 abdominal segments black.

Antennal joints black; elytra not fasciate; femora at apex, tibiæ at base and apex and tarsi black.....*uhlerii* Horn.

Antennal joints 3–6 red; elytra with broad median fascia red; femora, tibiæ and tarsi red.....*trifasciata* Say.

Abdomen entirely black.

Antennal club 6-jointed.

Head reddish, at sides and in front beneath black; thorax convex, apical and basal margins black.....*convexicollis* Horn.

Antennal club 5-jointed.

Head metallic black.

Greenish black, thorax reddish-yellow with a rather large green discoidal spot, elytral interstices with a few scattered punctures, underside of abdomen faintly punctate, metasternum uniformly, sparsely and clearly punctate, prosternum rather deeply punctate, antennæ rather elongate, club loose, last joint elongate.....*lecontei* Cr.

Brassy black, thorax red, interstices appearing obsoletely but thickly punctulate, underside nearly smooth..*collaris* Lec.

Head red.

Seventh antennal joint at apex about one half the width of the ninth at apex, club not very much produced within, elytra blue.

californica Fall.

Seventh antennal joint at apex of nearly the same width as the ninth at apex, club very much produced within, elytra black.

Elytral intervals with very obsolete punctures and irregular elongate impressions.....*sanguinicollis* Chev.

Elytral intervals with a very fine series of small punctures, varying in strength.....*læta* Lec.

I have not been able to secure specimens of *lecontei* and *collaris* and the characters used for separation are taken from the descriptions. The two last species seem to be very close, *sanguinicollis*, which is said to occur in Texas, is not known to me and I have used the characters given by Mr. Gorham to differentiate the two species. *Languria tædata* Lec. is somewhat intermediate between the genera *Dasydactylus* and *Languria*, the anterior legs in the males are similar to those of *Dasydactylus*; the femora and tibiæ asperate beneath in the males is one of the characters used in defining that genus. The last mentioned character seems to have escaped the observation of Crotch and others.

Languria trifasciata Say is in my opinion entitled to specific rank; it has always the apices of elytra more pointed than *angustata*, the markings and the intermediate red antennal joints and the red metasternum seem to be also quite constant. Specimens of *angustata* are occasionally found with the red at sides of elytra extending nearly to suture, but the color is never clear red, the metasternum and the intermediate antennal joints always invariably black.

Acropteroxys gracilis Newman.

Specimens occurred at Brownsville with the typical form with the thorax entirely red or only a black basal spot approaching Dr. Horn's *divisa*.

Dasydactylus cnici, new species.

Elongate metallic green, underside reddish with metallic tint. Head sparsely punctured, antennæ concolorus except the last four joints which are black, club five-jointed. Thorax finely punctate, longer than wide, slightly arcuate at sides, feebly sinuate before basal angles, which are rectangular. Elytra gradually narrowing to apex, apices rounded and dentate; striæ not impressed, punctate, intervals smooth with a row of fine punctures. Underside reddish with metallic tint, very finely and sparsely punctate, last abdominal segment darker and a little closer punctured at sides. Femora, tibiæ and tarsi metallic green. Length, 6–10 mm.

S. Tomas and Esperanza Ranch, Brownsville, Tex. Types 6 specimens selected from a large series. Cotypes are in the Nat. Museum in Washington. *Dasydactylus* differs from *Languria* and allied genera in having the apices of elytra serrate, the males have the

front legs long, tarsi broadly dilated and the femora and tibiæ inside serrate.

This species is quite common and occurs especially on *Cnicus virginianus*.

I have used Mr. Schwarz' MSS. name under which specimens are distributed in collections.

Type. — No. 8157, U. S. National Museum.

Rhinomalus texanus, new species.

Piceous shining, beak reddish, elytra on each side one third from base with a flavate fascia not attaining the suture nor side margin. Head prolonged into a beak, between the eyes, longitudinally impressed, sparsely punctured; beak depressed, margined at sides and slightly carinate at middle, dilated at apex. Antennæ with the first joint as long as the next three, joints 2, 4 and 5 subequal, third a little longer than either the second or fourth, joints 6–11 broader forming a distinct club, eleventh longer than any of the preceding, which are equal among themselves. Thorax distinctly and somewhat sparsely punctured, as long as broad, arcuate in front, gradually narrowing to base, becoming abruptly narrower a little in advance of basal angles, on each side of disk a deeply impressed longitudinal line. Elytra, broader at base than the thorax, arcuate at sides, rotundate truncate at apex, striæ faintly impressed, intervals flat, very finely and sparsely punctate, a flavate fascia one third from base, not attaining side margin nor suture. Underside piceous sparcely punctate. Length, including the beak 2–4 mm.

Brownsville, Texas (La Tolusa and Esp. Ranch). Four specimens in the Museum of the Brooklyn Institute. *Rhinomalus* differs from *Læmophlœus*, to which it is nearly allied, by the head being prolonged into a beak, by the front coxæ more approximate and the prosternum slightly bent upwards behind the coxæ.

A number of specimens were taken in May at Tolusa at light and three specimens at Esperanza Ranch, July 1, by beating dead branches of *Acacia flexicaulis*.

Loberus ornatus, new species

Elongate, testaceous, more convex than *impressus*, disk of thorax, two large spots at base and a broad median fascia extending along the sides nearly to the humeri of elytra, blackish. Head sparsely punctured, denser in front of the eyes, which are convex and slightly prominent. Antennæ a little longer than the head and thorax, last three joints black. Thorax strongly transverse, apex truncate, front angles rounded, sides slightly arcuate, sparsely serrulate, basal angles rectangular, acute, base slightly lobed; disk convex rather coarsely sparsely punctured, finer at sides, basal transverse impression more acute than in *impressus*. Elytra more convex than *impressus*, arcuate at sides and slightly narrowing to apex, which is rounded, side margin below the humeri rather broadly explanate, disk with rows of not coarse nor very closely placed punctures, internals flat with a row of very widely placed smaller

punctures, the punctures of the striæ and internals each bearing a short, fine, recumbent pale hair. Body beneath concolorous, pro- and metasternum coarsely, sparsely punctate, abdomen sparsely punctured each puncture bearing a pale hair. Legs paler. Length, 2–2.25 mm.

Two specimens, Brownsville, Texas (S. Tomas and Fort Brown) in the Museum of the Brooklyn Institute of Arts and Sciences, cotypes in the Nat. Museum collected by C. H. T. Townsend and E. A. Schwarz. This can only be compared with *puberulus* Casey, from which it differs in coloration, more coarsely punctured thorax not subacute elytral apices and more convex elytra.

Tomarus chamæropis, new species.

Type. — No. 8158, U. S. National Museum.

Oval, black to piceous, apex of elytra paler, antennæ fulvous. Head sparsely finely punctured, antennæ slender, fulvous, fourth and fifth joint equal. Thorax much narrower than the elytra, slightly wider than long, front angles broadly rounded, sides nearly straight, hind angles rectangular, acute, base sinuate, basal foveæ deeply impressed. Elytra shining black, apex paler, about one third broader at base than the thorax, arcuate at sides and much narrowing to apex, surface rather coarsely but not densely punctured, punctures obliterated at apex, which is smooth and shining. Beneath piceous or paler, finely punctate, abdomen sparsely pubescent. Legs fulvous. Length, 1.5 mm.

Brownsville, Texas, three specimens in the U. S. Nat. Museum collected by E. A. Schwarz whose MSS. name I have used. Cotypes in the Museum of the Brooklyn Institute through the kindness of Mr. Schwarz.

Type. — No. 8159, U. S. National Museum.

By the nearly uniform color and narrow thorax this species is related to *niger* Sharp from Panama from which it is distingushed by the pale antennæ and legs, the fifth antennal joint equal to the fourth, the distinct basal foveæ of thorax and the more coarsely punctured elytra. The elytral punctures bear erect hairs, which seem to be on the thorax shorter and finer.

Teretriosoma chalybæum Horn.

With specimens, which agree with Dr. Horn's description and type, occurred one which has the front convex to the middle, at this point transversely sulcate, fringed with fine pale hairs, and below the transverse sulcation the surface deeply excavated, similar to *sexualis* described below and the Mexican *cavifrons*. While not able to absolutely prove it, yet I am convinced that it is the male of *chalybæum*,

with which I place it for the present, rather than create a possible synonym.

Teretriosoma sexualis, new species.

Subcylindrical, metallic green or blue, above somewhat coarsely not closely punctate, beneath more coarsely punctate, antennæ and legs reddish. Head between the eyes convex, at middle transversely sulcate and finely pubescent, below this sulcation very deeply excavated. Thorax withthe stria close to the margin, entire, the punctuation at apex a little finer and closer than near base. Baasl margin of elytra smooth, transversely impressed, faint on the disk, very deeply so and continued along sides to the middle of the humeral umbone, which is impunctate. Pygidium at middle acute, convex above, beneath concave. Prosternum truncate in front, longitudinally impressed on each side, not striate. Mesosternum semicircularly rounded in front, margined. Anterior tibiæ with eight, middle tibiæ with seven, hind tibiæ with five spines. Length, 2 mm.

Two specimens, Brownsville, Texas, in the Museum of the Brooklyn Institute.

I place with this species two specimens, which agree well with the type except that the front of head is convex and the pygidium more produced and which I regard for the present, according to th views expressed under *chalybæum*, as females. These supposed females are according to the description very close to *T. conigerum* Lewis described from an unique specimen from Guatemala but there is a difference in the number of spines of the tibiæ * the underside is not strigose-rugose and the abbreviated post-humeral stria, which is confluent with the basal impression, and when present in *conigerum* would have been mentioned in the description as to the presence or absence or number of striæ much importance is given in distinguishing species.

Teretrius levatus Horn.

I refer specimens which occurred frequently on dead branches of *Acacia farnesiana* at Brownsville, to Horn's *levatus*. They agree well with specimens collected in lower California by Mr. Beyer, except that in the Texas specimens there is a very small additional spine on the front tibiæ; size, form, sculpture are the same. It occurs also in S. Diego, Tex. and in Arizona where it was taken by Mr. Schwarz.

Camptodes texanus, new species.

Rounded, convex, testaceous, head, thorax and scutellum piceous shining, fading into rufous at sides of thorax and apex of clypeus, elytra greenish black. Labrum feebly lobed, the lobes rounded, not dentate. Thorax twice as broad as long, narrow-

*I have counted all the spines situated on the outer edge of the tibiæ.

ing to the front angles, base much broader than apex, basal angles broadly rounded, punctuation very fine and sparse on the disk, coarser at sides. Scutellum triangular black, shining with a few sparsely placed punctures. Elytra broader than long, greenish black, sutural striæ distant from the suture, but gradually approaching the suture towards apex, very close to the suture a row of very fine closely placed punctures, discal striæ represented by extremely fine, feebly impressed irregular lines, hardly visible at sides, interstices confusedly punctate; apex broadly rounded in both sexes, faintly sinuate before the sutural angles. Prosternum more coarsely punctate at middle, than prothorax, widened behind the coxæ, sparsely clothed with fine yellow hairs, metasternum a little more coarsely punctate than prosternum and abdomen, produced between the coxæ, marginal striæ obliterated in front; femora grooved for the reception of the flattened tibiæ, tarsi short, clothed thickly with yellow silken hairs. Length, 6 mm.; width, 4 mm

Brownsville, Texas, 2 specimens in the collection of the Museum of the Brooklyn Institute of Arts and Sciences.

A small number of this species were collected by Dietz, it was also taken by Prof. Wickham.

The genus *Camptodes* enters the tribe Cychramini of the family Nitidulidæ and will best be distinguished from the allied genera by the following table, which is the same as in the "Classification" with some slight alterations and the genus *Camptodes* added. *Psilopyga* is said to be distinct from *Oxycnemus* by Dr. Sharp.

Mesosternum protuberant in front, middle coxæ widely separated.
- Prosternum prolonged, broadly dilated at tip; body glabrous.
 - Labrum deeply bilobed; hind tarsi longer than the middle tarsi; prosternum at apex covering entirely the mesosternum *Psilopyga* Lec.
 - Labrum feebly bilobed; middle and hind tarsi equal in length; prosternum at apex not covering entirely the mesosternum..... *Camptodes* Er.
- Prosternum less prolonged and feebly dilated at tip, not covering entirely the mesosternum, bodypubescent *Amphicrossus* Er.

Mesosternum small, oblique not protuberant.
- Metasternum protuberant, widely separating the middle coxæ; prosternum not prolonged at tip, not laminiform, vertical behind the anterior coxæ; body glabrous..... *Cyllodes* Er.
- Metasternum not protuberant, middle coxæ narrowly separated.
 - Hind tarsi longer than the others; body glabrous..... *Pallodes* Er.
 - Tarsi equal in length, body pubescent *Cychramus* Kug.

Throscinus schwarzii, new species.

Elongate oval, somewhat depressed, blackish green, underside and legs ferruginous to piceous, pubescence very short and fine. Head very finely punctate with larger sparsely placed punctures intermixed, deeply inserted in the thorax as far as the eyes, which are large but not very prominent; antennæ slender, first four joints pale, last seven joints black, slightly longer than the head and thorax; first two joints stout, but the second not quite as wide as the first, three and four narrower than the

first two, subequal among themselves, joints five to ten broader than the preceding two and shorter, gradually but slightly increasing in width, eleventh slightly longer than the penultimate. Prothorax wider at base than apex, sides arcuately narrowing to apex, base lobed at middle, the lobe before the scutellum very slightly emarginate, posterior angles very slightly prolonged behind, apex truncate, front angles prominent acute; disk convex in front, at sides near front angles depressed, extremely finely punctate, intermixed with sparsely placed larger punctures. Scutellum distinct narrower behind, very finely punctate. Elytra at base as wide as the thorax, sides nearly parallel, narrowing slightly towards apex, which is gradually rounded and acute at apex; disk feebly convex finely punctate with larger punctures intermixed. Underside finely and densely punctate, finely pubescent. Length, 2–2.25 mm.

Brownsville, Texas (Tolusa and Esperanza Ranch at light). Types, four specimens in the Museum of the Brooklyn Institute. Cotype, one specimen, Hubbard & Schwarz Coll., U. S. National Museum.

Type. — No. 8160, U. S. National Museum.

This fine species is dedicated to Mr. E. A. Schwarz as a slight recognition of the many favors received, while on a visit to Washington. Differs from *crotchii* in the much finer, shorter pubescence and more subopaque surface, the distinct seven-jointed club, pale legs, as well as being not as convex. From Casey's *politus* the greenish piceous, subalutaceous surface, the seven-jointed antennal club and the different punctuation of elytra will readily separate it. The following table based on the differences mentioned above will help in separating our three species.

Pubescence of upper surface consisting of very fine and short hairs, body above subopaque antennæ with first four joints pale, the seven-jointed club black...*schwarzii*.

Pubescence of upper surface consisting of coarser and longer hairs, antennæ black, club six-jointed, body above shining.

Third and fourth joint of antennæ subequal.....*crotchii*.

Third joint of antennæ longer than the fourth, almost as long as the fourth and fifth together.....*politus*.

Cinyra prosternalis, new species.

Elongate, cupreous, thorax with at most a faint longitudinal median impression. Head æneous, coarsely punctured, denser in the clypeal region; antennæ metallic green, not quite as long as the head and prothorax; clypeus broadly emarginate; front with an impunctured inverted W-like design. Thorax broader at base than apex, with sharp hind angles, a faint longitudinal median impression, and one broad shallow impression on each side of base; moderately coarsely punctate, sparsely at middle, more densely and in some parts confluently at sides. Elytra about three times as long as the thorax, apex quadrispinose, intervals sparsely and more finely punctate, alternate intervals more convex towards apex. Prosternum smooth and shining, in some specimens extremely finely punctate, at sides very coarsely and transversely con-

fluently punctate a little below the apex a short transverse impressed line; metasternum longitudinally impressed at middle, coarsely punctate at sides, finer and sparser at middle; abdomen coarsely punctate at sides, sparser at middle, first segment somewhat depressed at base with a faint longitudinal median impression, reaching to the middle of the segment; last ventral segment truncate, a small, more or less prominent apical tooth on each side. Legs metallic green or æneous. Length, 12–16 mm.

Four specimens in the Museum of the Brooklyn Institute taken at Esperanza Ranch, Brownsville, Texas. Of the same form as *gracilipes*, from which it differs by the larger size, smoother, hardly impressed prothorax, elytra very much more feebly sculptured, the more prominent elytral spines, the remarkable smooth shining nearly unpunctured prosternum at middle, very coarsely and closely punctured in *gracilipes*, and the broadly emarginate clypeus which is in *gracilipes* triangularly emarginate.

Chrysobothris purpureoplagiata, new species.

Elongate, feebly depressed, color bright green, elytra with more or less distinct purple blotches at apical third, like *lucana* Horn, surface subopaque, very feebly shining. Head densely punctured, an irregular arcuate smooth space at top of a bright metallic red color; clypeus semicircularly emarginate, antennæ cupreous, slightly more slender to tip, third joint a little longer than fourth. Thorax about one and a half times as wide as long, sides straight, slightly convergent to base, anterior angles rounded, disk moderately convex, surface regular without any inequalities, punctuation denser at sides than at middle, slightly strigose, at each apical angle a more or less distinct cupreous spot. Elytra a little wider than thorax, parallel, very slightly wider behind the middle, becoming narrower to apex at apical third where the margin is coarsely serrate, apices obtuse, disk at about basal third with a faint rounded fovea at middle, basal and infra-humeral foveæ distinct; surface somewhat coarsely and asperately punctured at base, gradually finer towards apex. Body beneath similar in color but more shining, sparsely punctate, ventral segments without callosities, margins of the last distinctly serrulate-prosternum lobed in front, coarsely and densely punctate; anterior femur with a small, acute tooth, and a few denticulations externally. Length, 6–7 mm.

Male.—Prosternum convex, coarsely and closely punctured, anterior tibiæ slightly arcuate, a short dilation near apex; middle and posterior tibiæ straight; last ventral segment, semicircularly emarginate; last dorsal slightly notched at middle.

Florence, Arizona, 3 specimens received from Mr. G. Franck as *C. prasina* Horn from which it is abundantly distinct.

The even thorax and the serrulate last ventral segment place this species in Dr. Horn's Group I, near *purpureovittata*, from which it is distinguished by the somewhat subopaque surface, the semcircularly emarginate clypeus and the slight median foveæ of elytra. The purple blotches are variable in size, they may extend to the base or

may be present only at apex; these blotches, if longitudinally confluent are never regular in outline as the vittæ in *purpureovitta*, being nearly the same as in *lucana*.

Chrysobothris beyeri, new species.

Form of *femorata*, but slightly more convex, cupreo-æneous, thorax more cupreous. Head transversely strigosely punctured, at top an arcuate carina, at middle between this and the clypeus two smooth callosities; antennæ cupreous, gradually more slender to tip, third joint a little shorter than the next two; clypeus broadly emarginate, arcuate each side. Thorax twice as broad as long, narrowed at apex and base, slightly arcuate at sides; disk feebly convex, median sulcus distinct, on each side near margin a shallow rounded impression, surface transversely strigose, not coarsely punctured. Elytra a little wider than the thorax, parallel to nearly apical third, then gradually narrowing to apex, apices obtuse, sides not strongly serrate; the subsutural costa more elevated from a little before middle to apex, the second costa elevated from base to apex but interrupted at basal third, the third costa more feeble and interrupted at a little behind middle by a fovea, which is more finely sculptured than the rest of surface, the fourth costa near margin entire; surface sculpture rugose, punctuation somewhat sparse, basal and humeral impressions feeble. Body beneath coarsely punctured, each ventral segment at side with a distinct callosity; prosternum in front very feebly arcuate; anterior femora with a broad tooth, serrulate on its margin, last ventral with serrulate margin. Length, 11–12 mm.

Male. — Prosternum moderately densely punctate, and finely pubescent; anterior tibiæ arcuate, broadly dilated at tip, middle tibiæ straight, slightly bent at apex, hind tibiæ straight; last ventral segment, broadly emarginate, last dorsal truncate.

Female. — Prosternum as in the male, anterior tibiæ slightly arcuate, middle and hind tibiæ straight; last ventral segment not as broadly emarginate as in the male, more semicircular.

San Felipe, Lower California; four specimens in the Museum of the Brooklyn Institute from Mr. G. Beyer in whose honor I have named this species as a slight recognition of the many favors received. *C. beyeri* resembles *texana* in color and sculpture but very distinct from it by the different emargination of the clypeus and last ventral segment and the much more feeble prosternal lobe, the anterior tibiæ of the male in this species are not sinuate before the dilatation as is the case in *texana*. As I am informed by Mr. Beyer this species is very abundant on willow in the dry season in May and June.

Chrysobothris peninsularis, new species.

Form of *floricola*, color dark bronze; antennæ short, metallic green, slightly narrowing to apex, third joint as long as the next two; clypeus very broad, but shallow emarginate at middle. Thorax twice as wide as long, sides nearly parallel, very slightly narrower at base, more rounded and narrowed at apex than at base, disk feebly convex, a vague median impression and very obsolete, rounded impression at sides; punctuation sparser at middle, coarse and confluent at sides. Elytra very little

wider than the thorax, parallel, gradually narrowing to apex from a little behind the middle, margin serrulate, apices obtuse; disk feebly convex, the first costa elevated, obsolete in basal third, second costa interrupted by a rounded impression, which is more densely punctured than the rest of elytra, third costa interrupted by a fovea a little behind the middle, between the first and second costa, at about apical fourth is a smooth, densely and more finely punctured spot; basal foveæ deeply impressed; surface on the disk sparsely punctured, very densely at sides. Underside bright cupreous, abdomen moderately densely punctate, with elongate punctures, each segment on each side with a smooth callosity, last segment serrulate, truncate emarginate at apex, with the angles acutely prolonged. Last dorsal sparsely to coarsely punctured, blue, bronze around the triangular emargination. Anterior femora with a moderate tooth, serrulate on its distal margin; anterior tibiæ arcuate, slightly dilated at apex with a sharp tooth in front of dilatation, middle tibiæ arcuate, hind tibiæ slightly sinuate. Length 11.25 mm.

San Felipe, Lower California, one male from Mr. G. Beyer in the Museum of the Brooklyn Institute.

Chrysobothris subapaca, new species.

Elongate, slightly depressed, color green, each elytron with an elongate irregular purple spot at apical third, surface subopaque, beneath green shining. Antennæ æneo-cupreous, third joint a little longer than fourth, front slightly convex, with a faint chevron; clypeus triangularly emarginate; thorax twice as wide as long, arcuate at sides, disk convex, a moderately deeply impressed line at middle, a vague median impression at sides near margin, somewhat coarsely punctured, more densely at sides. Elytra a little wider than the thorax, parallel, narrowing to apex at apical third, margin feebly serrulate, apices obtuse; disk very slightly depressed, costæ obliterated in front, faintly indicated behind, basal foveæ faintly indicated, between the first and second costæ at middle a faint longitudinal impression, surface uneven, finely rugose, punctuation finer than that of thorax, becoming obsolete towards apex. Body beneath transversely confluently punctured, last segment with feeble serrulate margin, prosternum lobed in front; anterior femur with a moderately large tooth, serrulate externally.

Tulare Co., California, one male in collection Dietz.

Male. — Prosternum distinctly depressed at middle, densely punctate, sparsely pubescent, anterior tibiæ nearly straight, with a very feeble dilatation at tip; middle tibiæ nearly straight, dilated at tip, posterior tibiæ straight; last ventral segment semicircularly emarginate; last dorsal truncate at tip, somewhat coarsely punctate. Length, 7 mm.

Although a little more depressed than *cyanella* Horn it is best placed near that species from which it differs by the opaque surface, the entirely different surface sculpture and the two irregular elongate purple spots at apex of elytra, which are perhaps as variable as in *lucana* and *purpureoplagiata*.

Actenodes flexicaulis, new species.

Elongate, dull bronze to nearly black, underside metallic green or blue, cupreous at sides. Antennæ metallic green to purple. Clypeus truncate, with a very feeble tooth at middle, front very coarsely asperately punctured with the usual chevron-like design. Thorax twice as wide as long, narrower at apex than at base, sides straight, subbasal transverse impression strong; punctuation denser at apex, punctures larger and more sparsely placed at sides and base. Elytra a little wider than the thorax, parallel nearly to the middle, slightly widening behind the middle and then arcuately narrowing to apex, which is obtuse, side margins serrulate; surface scabrous, costæ distinct at about apical half, stronger at apex; base transversely impressed, the impression metallic green, a strongly angulate irregular fascia at about basal third, an oblique fascia slightly behind middle and a large spot between suture and first costa metallic green and cupreous, the spot and the lower costa sometimes united by a narrow cupreous lines, sides at apical third narrowly margined with metallic green. Body beneath shining, abdomen sparsely punctate, the punctures not deeply impressed. Length 7.50–10.25 mm.

Esperanza Ranch and S. Tomas, Brownsville, Tex. Four specimens in the Museum of the Brooklyn Institute.

I have taken a small number of this fine species from branches of *Acacia flexicaulis*, in which it undoubtedly breeds; no specimens were taken on any other tree.

The North American species of *Actenodes* now known may be separated by the following table.

Eyes on the occiput separated by about their own width.

Robust unicolorous, elytra without costæ, front convex not longitudinally impressed. *menæax*, Horn.

Eyes on the occiput narrowly separated by about half or less of their own width.

Elytra not distinctly costate, or at most the costæ indicated by smooth more or less distinct lines, hind angles divergent, faintly in some specimens of *acornis*.

Elytra unicolorous, without golden or metallic spots or fasciæ, front convex not longitudinally impressed.....*acornis*, Say.

Elytra with suture, margin near apex, humeri and four spots on each side metallic green or cupreous, front longitudinally impressed. *auronotata*, Lap. & Gory.

Elytra with one strongly angulated, very indistinct, metallic green and cupreous fascia before the middle and one behind, ending in a slight fovea near side, basal depressions and suture at base metallic green; front longitudinally impressed, costæ faintly indicated.....*calcarata*, Chev.

Elytra distinctly costate in apical half, the costæ distinctly raised and more prominent towards apex, hind angles, or more properly the sides of thorax near base convergent, elytra with a strongly angulated metallic green and cupreous fascia before middle and an oblique one continued down the first costa for a short distance and approaching the suture, front faintly impressed..*flexicaulis*, n. sp.

Acmæodera rubescens, new species.

Nearly of the form of *gemina*, piceous, thorax and head very faintly bronzed, body beneath with scale-like white hairs, sparsely placed, the elytral markings are an exact reproduction of those of *opinabilis* but in addition the apex is bordered with red. Antennæ with the fifth joint much wider than the fourth. Front convex, coarsely and closely punctate. Thorax twice as wide as long, widest behind the middle, arcuate at sides, narrowing to apex, slightly sinuate behind the middle, hind angles rounded, lateral margin not visible from above, disk slightly depressed, a faint fovea at middle and one on each side near hind angles, surface very coarsely, cribrately punctured, opaque very slightly bronzed, a small yellow spot on each side near the hind angles. Elytra narrower at base than the thorax at middle, sides slightly narrowing to the middle then arcuately narrowing to apex, margin serrate, striæ with coarse deep closely placed punctures, intervals narrower than the striæ, maculation yellow exactly like *opinabilis* with the apex bordered with red. Prosternum very coarsely punctate, anterior margin slightly sinuate, nearly attaining the anterior angles. Metasternum and abdomen coarsely punctate each puncture bearing a scale-like white hair. Last ventral segment with double margin caused by a few confluent punctures. Length, 6 mm.

Santa Rosa, Lower California. One specimen in the Museum of the Brooklyn Institute from Mr. G. Beyer.

This species has to be placed near *gemina* and *insignis*.

Mastogenius reticulaticollis, new species.

Elongate oval, black, elytra dark blue, thoracic sculpture reticulate. Head convex, with a slight median impression, moderately coarsely punctured. Thorax nearly twice wider than long, sides slightly arcuate, nearly parallel behind, base truncate, carina at sides obliterated at apex, gradually narrowing towards the side margin at base, surface distinctly reticulate, base slightly transversely impressed with a row of punctures. Elytra as broad as the thorax at base, sides gradually narrowing to apex, base acutely and strongly impressed, surface shining, dark blue, finely punctured, a little coarser at sides, punctures somewhat elongate. Beneath black, prosternum, metasternum and last ventral segment coarsely punctured, the rest of abdomen more sparsely and finely. Length, 2.5–3.5 mm.

Five specimens, Brownsville, Texas, two in the collection of the Museum of the Brooklyn Institute, two in coll. Dietz, all four collected by the late Ottomar Dietz, and one in the Nat. Museum in Washington collected by C. H. T. Townsend, this latter one is the largest. Distinguished from *subcyaneus* by the form and sculpture of prothorax, the feeble frontal impression and the entire black legs and antennæ.

Type.—No. 8161, U. S. National Museum.

Agrilus dollii, new species.

Form, size, color and markings of *lecontei*, but a little more robust, each elytron at apex emarginate. Antennæ reaching to about the middle of the thorax, piceous with æneous lustre, serrate from the fifth joint; head slightly convex, rather broadly

longitudinally impressed; surface coarsely punctate, strigose. Thorax a little wider than long, sides feebly arcuate, in some specimens nearly straight, side margin sinuate, hind angles rectangular, carinate; disk moderately convex, with a deep median impression, composed of two broad foveæ united by a groove, lateral oblique depression moderately deep, surface coarsely punctate, transversely strigose. Scutellum transversely carinate. Elytra feebly sinuate behind the humeri, broadened behind the middle, narrowing to apex, each tip emarginate and serrulate; disk slightly depressed with a faint indication of a costa on each side, surface subgranulate with pubescent spaces exactly as in *lecontei;* body beneath sparsely pubescent; prosternal lobe broadly emarginate, intercoxal process narrower between the coxæ, dilated behind and truncate apex. Abdomen sparsely punctate, vertical portion of the first two segments not much denser than at middle; pygidium feebly carinate, carina not extending to apex, claws cleft at middle forming a broad tooth. Length, 4–5.5 mm.

Brownsville, Texas (Esperanza Ranch and Tolusa, May, June and July). Four specimens in the Museum of the Brooklyn Institute.

Dedicated to my friend and companion Mr. Jacob Doll in remembrance of the interesting trip made together to the lower Rio Grande region.

This species has to be placed near *impexus* in Dr. Horn's table, from which it differs in the emarginate prosternal lobe, different markings, the emarginate elytral apices and smaller size. From *lecontei* which it very closely resembles it differs in having the front impressed and the elytral apices emarginate.

Rhæboscelis texana, new species.

Elongate, slightly shorter and more robust than *tenuis*, thorax and elytra brown with slight metallic lustre. Head finely punctured with coarser not very closely placed punctures intermixed, front deeply impressed; antennæ serrate from the sixth joint. Thorax as long as broad, sides strongly deflexed in front, less strongly near base, side margin not visible from above, apex feebly arcuate, base strongly bisinuate, median lobe truncate, disk impressed at middle, sides and base, the two on the basal lobe foveæ-like, the two outer ones more elongate, the latter a short distance from basal angles, surface transversely, arcuately strigose. Elytra about two and one half times as long as the thorax, sides slightly narrowing to middle, then arcuate and narrowing to the apex, apices truncate, basal impressions large, a slight depression before the humeral costa, sides declinous to about the middle, surface rugosely sculptured. Antennal groove deep, abdomen shining, with very fine-punctured, densely placed and some larger ones more sparsely placed. Pygidium carinate at middle, with a sharply limited oblique channel on each side, continued along the carina not quite to apex. Length, 3 5–4 mm.

Brownsville, Texas (Esperanza Ranch). Four specimens in the Museum of the Brooklyn Institute. As compared with *tenuis* this species is shorter, more robust, thorax more convex, with the side

margin not visible from above, and the surface not impressed across the middle.

Paraptorthodius, new genus.

Head deflexed; eyes lateral, convex, prominent; mandibles slightly arcuate, acute, not dentate. Last joint of maxillary palpi slightly widening to apex, obliquely truncate, last joint of labial palpi oval. Antennæ twelve jointed, second and third joint each shorter than first, joints four to eleven, each with two oval, leaf like appendages at base, twelfth with one similar appendage, but closely soldered to the entire length of the joint, each of these joints except the last have in addition a short tooth-like process on the underside at middle, of the same texture as the leaf-like appendages. Side margin of thorax slightly thickened, prothoracic epipleuræ parallel, distinct. Prothorax beneath broadly deeply emarginate in front.

Type.—Paraptorthodius mirabilis.

The twelve-jointed antennæ brings this genus near the Central-American *Ptorthodius*, from which it differs by the deflexed head, mandibles slightly arcuate and the structure of the antennæ. The head in the single specimen is exserted but the excavation of the thorax beneath is undoubtedly intended for the reception of the head.

Mr. Gorham has transferred *Ptorthodius*, *Euryopa*, and our *Mestinocerini*, to which the first two genera are allied, to the Lymexylidæ. While he may be correct in this, yet I think it is not advisable without a thorough critical study of both families to make such a change. *Tytthonyx* included by Leconte in this tribe is not mentioned, it is a disturbing element there and may have to be removed.

Paraptorthodius mirabilis, new species.

Yellowish, elytra abbreviated, antennæ short, twelve jointed, joints two and three short, four to eleven on each side of base with a leaf-like appendage, twelfth compressed, leaf-like, and each joint, except the last, in addition on the underside at middle, a tooth-like process of the same texture as the appendages. Head without the eyes quadrate, coarsely and densely punctured, impressed between the antennæ; eyes large, rounded, prominent; antennæ twelve jointed, first joint stout, as long as the next two, second nearly as stout as the first one, but shorter, broader at apex than at base, third shorter and narrower, four to ten subequal among themselves, eleventh a little longer than the tenth, twelfth as long as the tenth, joints four to eleven with a leaf-like appendage on each side of base, twelfth compressed, leaf-like and each of these joints except the twelfth has in addition on the underside at middle a tooth-like process. Thorax as long as broad, apex slightly arcuate and feebly widening to about basal fourth, then suddenly obliquely narrowing to base which is hardly wider than the scutellum, disk with a broad impression near base, surface not quite as densely punctured as the thorax. Scutellum nearly as wide as the thorax at base, truncate at apex and coarsely punctate. Elytra shorter than half of the length of the breast and abdomen, at apex rounded and slightly narrower than at base, somewhat

rugosely punctured, coarser at base than at apex; wings grayish, veins darker. Under surface more finely punctured than the upper surface. Last joint of maxillary palpi slightly widening to apex and obliquely truncate, last joint of labial palpi oval. Prothorax beneath broadly and deeply emarginate in front just before the front coxæ. Hind tibæ outside longitudinally impressed at apical half. Abdomen broad, gradually narrowing to the sixth ventral, last segment conical. Length, 7 mm.

One specimen in the Hubbard and Schwarz coll. U. S. National Museum, taken by Mr. Schwarz, June 6, in San Diego, Texas.

Type.—No. 8162, U. S. National Museum.

This insect is very remarkable by the structure of the antennæ. I have called the twelfth joint compressed leaf-like, which appearance it has, but it is more correct as given in the generic description, that to the entire length of the twelfth joint an appendage is soldered similar in shape and texture to the others, given this joint the appearance of a leaf like appendage of the eleventh joint.

The apendages and tooth-like projections are much paler in color than the joints. There may be some doubt as to the correctness of my observation in regard of the twelfth antennal joint, but I have carefully examined the antennæ from every point and the specimen was excellently mounted by Mr. Schwarz, and in good condition. On looking from above the division between the eleventh and twelfth joint could be as plainly seen as that between the tenth and eleventh.

Cenophengus ? pallidus, new species.

Elongate, opaque, pale yellowish; thorax distinctly longer than wide, side margin deflexed more widely at apex. Head flat, parallel, coarsely punctured, moderately, densely pubescent with pale hairs; eyes large, convex, rounded; antennæ eleven jointed, biramose from the fourth joint. Thorax distinctly longer than wide, narrower at apex, sides slightly arcuate, side margin broadly deflexed near apex, narrow at base, basal angles variable, base slightly lobed at middle, disk alutaceous, with coarse punctures, sparsely placed and not deeply impressed. Elytra short, not quite half as long as the body, narrowing to apex, which is subacutely rounded, disk finely granulate, punctate smoother near base. Maxillary palpi long, last joint triangular or rather securiform, labial palpi short with last joint oval. Last ventrat segment narrowly, rather deeply, emarginate. Length, 3 mm.

Brownsville, Texas (Esperanza Ranch, June). Four specimens in the Museum of the Brooklyn Institute.

This species is not a *Cenophengus* according to our present classification, there is no acute side margin of the thorax and the last joint of maxillary palpi is not cylindrical. Dr. Leconte's generic description is very short and in absence of specimens for comparison I prefer to leave it in this genus for the present.

The following table of the genera of the Mastinocerini, the two Mexican ones included, is based on the characters given in the descriptions of the genera.

Antennæ twelve-jointed.

Joints four to eleven of antennæ each with two short leaf-like appendages at base, between these at middle a smaller dentiform process; soldered to the entire length of the twelfth joint is an appendage, similar in shape and texture to the larger ones; mandibles slightly arcuate, acute, not toothed; last joint of maxillary palpi gradually widening to apex, which is obliquely truncate, last joint of labial palpi oval.....*Paraptorthodius*, n. g.

Joints four to eleven biramose, twelfth simple; mandibles strongly falcate; last joint of maxillary palpi gradually widening to apex, which is obliquely truncate, last joint of labial palpi oval.....*Ptorthodius*, Gorh.

Antennæ eleven-jointed.

Antennal joints three to ten biramose, last joint of maxillary palpi subequal to the preceding, ovate; eyes beneath nearly contiguous.....*Euryopa*, Gorh.

Antennal joints four to ten biramose.

Prothorax as long as wide, flanks acutely margined, maxillary palpi with last joint securiform.....*Mastinocerus*, (Sol.) Lec.

Prothorax as long as wide, flanks acutely margined only behind the middle, obliterated in front; maxillary palpi with the last joint long and cylindrical.....*Cenophengus*, Lec.

Tytthonyx ruficollis, new species.

Red, antennæ, palpi, elytra, wings, tibiæ in great part, and tarsi black. Head red, broader than long, deflexed, finely, densely punctate, eyes small, rounded, convex, finely granulated. Antennæ nearly as long as the entire body, black, first joint more or less red, compressed, serrate, joints triangular, second shorter and narrower than the third, outer joints narrower than the intermediate joints. Prothorax red, transverse, truncate in front, broadly rounded behind, surface closely and finely punctate, a fine median impressed line more or less distinct, and a few vague shallow impressions, as in *erythrocephalus*, variable in distinctness. Elytra black, one half as long as the abdomen, rounded at tip, slightly costate, faintly rugosely punctured. Abdomen red, legs black except femora at base. Length, 3.5–4 mm.

Brownsville, Texas (S. Tomas, Esperanza Ranch).

Types.—Four specimens.

In *erythrocephalus* the antennal joints differ in the two sexes. There is a little difference in the antennæ in the specimens before me but the last two abdominal segments are truncate at apex in all the specimens.

Cymatodera peninsularis, new species.

Nearly of the form of *texana*, pale, head, apex of thorax, base, suture and a lateral line, widened behind the middle black. Head black, mouth parts pale, somewhat sparsely punctured in front, more closely on the occiput; antennæ stout, pale,

reaching nearly to the middle of elytra, second joint smaller than the third, which is about one third longer than the second, joints five to ten of equal width, but gradually decreasing in length, last joint oval, one third longer than tenth. Thorax as long as broad, very finely and sparsely punctured, more densely in front, pale testaceous, black in front of apical constriction, sides strongly narrowed behind, base narrower than apex, a slight antescutellar impression. Elytra wider than the thorax, humeri prominent, sides parallel, apices separately rounded, surface with striæ of closely placed not very large punctures, intervals with very sparsely placed fine punctures bearing erect hairs, pale testaceous, a fascia across the base, suture nearly to apex and at sides a narrow line, arcuately widened behind the middle, black; side margin to the middle pale. Body beneath and legs pale. Length, 6 mm.

San Felipe, Lower California. Two specimens from Mr. G. Beyer in the Museum of the Brooklyn Institute. The fifth abdominal segment is triangularly emarginate, the last dorsal nearly truncate, extremely feebly sinuate at middle, broader and larger than the sixth ventral, they are probably males. The second joint smaller than either of the two following places this species near *xanti* of Dr. Horn's table, from which and from all our other species the elytral markings separate it. In some specimens in Mr. Beyer's collection the black markings are more or less confluent and the elytra may be then more properly described as black with two pale spots, one large elongate, one starting below the humeri and a smaller one at apex.

Cymatodera obliquefasciata, new species.

Form of *inornata* but more robust, brown, with an oblique yellowish fascia at middle, reaching to the seventh striæ, the sixth interval from the humeri to the fascia yellowish, in some specimens only faintly indicated near the humeri and the fasciæ. Antennæ a little longer than head and thorax, serrate from the fourth joints, first joint stout, as long as the next two, second joint small half as long as the third, joints four to ten broader, serrate, subequal, eleventh elongate, narrower, as long as the two proceding joints. Head coarsely somewhat cribrately punctured. Thorax longer than broad, convex, sparsely hairy, sides nearly straight with a very feeble tubercle at middle, surface somewhat vermiculate, no antescutellar impression. Elytra broader than the thorax, humeri prominent, widening to apical third, then arcuately narrowing to apex, which are separately rounded; disk moderately convex, with ten rows of coarse closely placed punctures becoming gradually finer towards apex and entirely obliterated in the apical region, intervals slightly broader than the striæ, flat, finely punctate. Pro-, meso- and meta-sternum brown, the latter at sides and abdomen testaceous, abdomen finely punctate, femora and tibiæ brown, tarsi testaceous. Length, 10–11 mm.

Brownsville, Texas (Esperanza Ranch), from *Acacia flexicaulis*.

Three specimens in the Museum of the Brooklyn Institute. The fifth ventral is very slightly sinuate at middle, the sixth narrower, rounded, last dorsal semicircular. The specimens seem to be females.

To be placed by the structure of the antennæ near *xanti*, of Dr. Horn's table from which it differs by the longer third joint, the more coarsely sculptured thorax, the intervals confusedly punctate and the oblique fascia.

Cymatodera latefascia, new species.

Moderately robust, color testaceous, head, thorax and base of elytra darker, a broad fascia from the middle to not quite the apex black. Head somewhat coarsely, in some parts confluently punctured, eyes moderately prominent. Antennæ as long as half the body, joint two small, three a little longer than the second, fourth joint as long as the second and third together, four to ten nearly equal, elongate, eleventh very little longer than the tenth. Thorax longer than wide, base narrower than apex, feebly constricted in front of middle, strongly compressed at sides behind, disk moderately, coasely, confluently punctate. Elytra nearly twice as wide as the thorax at base, humeri distinct, sides parallel, apex rounded, disk feebly convex, with striæ of large close punctures, becoming gradually smaller and obliterated at extreme apex, intervals as wide as the striæ, slightly convex, with a single row of fine, sparse punctures, from each puncture arises a single hair. Body beneath and legs testaceous, metasternum sparsely punctured, more coarsely and densely at sides, abdomen finely punctate. Length, 8–8.5 mm.

Fort Grant, Arizona; New Mexico.

Three specimens; a female in the Museum Collection from the first named locality, kindly given by Mr. Schwarz, another female from New Mexico and a male from Arizona without definite locality in the Dietz Collection. The male has the hind margin of the fifth ventral segment truncate, sixth feebly, broadly emarginate, last dorsal broadly emarginate, angles rounded, longer and broader than the sixth ventral. The hind margin of the fifth ventral in the female is truncate, the sixth rounded at apex.

Type. — No. 8163, U. S. National Museum.

Cymatodera fuchsii, new species.

Brown, slender, rather densely pubescent with moderately long hairs and longer, sparse, erect hairs intermixed; elytra perforate punctate, with a pale median fascia not quite distinct and irregular in outline. Head rather coarsely punctate, densely pubescent with moderately long and longer erect hairs intermixed; eyes moderately prominent; antennæ nearly reaching to the middle of elytra, joints slender, first joint as long as the next two, two to ten subequal, eleventh longer than tenth pointed at tip. Thorax nearly twice as long as wide, slightly constricted in front and feebly compressed behind, without antescutellar impression, disk coarsely and densely punctate, densely pubescent with moderately long decumbent hairs and sparser longer intermixed. Elytra nearly twice as wide as the thorax at base, humeri distinct, sides parallel to apical fourth, then narrowing to apex, apices separately rounded, disk with rows of large perforate punctures, becoming finer towards apex, intervals flat, sparsely

punctate, moderately densely pubescent with shorter decumbent hairs, sparsely intermixed with longer erect hairs, color a little paler than the head and thorax, at middle a broad paler fascia irregular in outline. Body beneath slightly paler than above, metasternum moderately coarsely punctured, abdomen more sparsely. Legs pale testaceous, pubescent with shorter and longer hairs. Length, 8 mm.

Texas, one male in my possession kindly given to me a few years ago by Mr. Chas. Fuchs to whom this species is dedicated.

This species is to be placed near *punctata* Lec. with which it is confused in nearly all the collections possessing it. It differs from that species by the longer, coarser pubescence, large perforate elytral punctures, the apices separately rounded and the penultimate ventral segment broadly triangularly emarginate, the last broadly emarginate with the angles prolonged, the last dorsal is narrower than the last ventral and apparently broadly rounded at apex, or truncate, the vestiture being dense and obscuring this part.

Cymatodera van dykei, new species.

Brown, form slender, body apterous, surface sparsely pubescent, elytra with an indistinct pale transverse fascia about middle. Head very densely punctured, eyes feebly prominent. Antennæ scarcely longer than the head and prothorax. Thorax much longer than broad, constricted in front of middle and behind, base narrower than apex with distinct antescutellar impression, on each side tuberculate, surface transversely strigose in front coarsely punctured in male, in the female the punctation is very dense but very faintly strigose. Elytra very little wider at base than the thorax, humeri feeble, sides feebly arcuate, slightly broadening to apex, apices separately rounded; disk with rows of coarse punctures, closely placed, becoming slightly smaller to apex. Body beneath and legs paler, finely and moderately closely punctate. Length 11–12 mm.

Male. — Fifth ventral segment broadly moderately deeply emarginate, sixth small, parallel, triangularly emarginate, with the angles very much prolonged; to sixth dorsal elongate, very little narrower at apex which is truncate, with a very feeble notch at middle.

Female. — Fifth ventral nearly truncate, sixth broadly oval at tip, last dorsal broadly oval at tip.

California (Los Angeles Co.).

Two specimens kindly given to me by Dr. Van Dyke to whom this species is dedicated.

Related to *angustata* and *ovipennis* from both of which it is distinct by the different form of the fifth and sixth ventral segments; *angustata* which it more nearly resembles has shorter antennæ. The ten specimens of *ovipennis* before me have the thorax more compressed behind than *angustata* or *van dykei*.

Colyphus furcatus, new species.

Elongate, black, thorax roseate with a furcate black basal mark, elytra brown to piceous, very near to the suture and parallel with it a longitudinal yellowish-white vitta on each side. Antennæ black, joints 4–10, very feebly increasing in width, eleventh longer. Head black, very finely and sparsely punctured, clypeal region yellow, front with a semicircular impression. Thorax wider than long, constricted at apex and very strongly so near base, sides broadly arcuate, surface somewhat coarsely but very shallowly punctate, color roseate when alive or in well-preserved specimens, yellowish in old specimens, a furcate black mark at base. Elytra broader at base than the thorax, sides nearly parallel, not expanded, apex conjointly rounded, densely and moderately coarsely punctate, color brown to piceous, a yellowish-white vitta starting a little below the base to nearly to apex, closer to suture than to the side margin. Underside and legs black, except femora at base and thorax beneath reddish. Length, 6–6.5 mm.

Brownsville, Texas (San Tomas, Esperanza Ranch).

Types.—Four specimens in collection of the Museum of the Brooklyn Institute of Arts and Sciences.

This species resembles the Mexican *quadrilineatus* but according to the description differs by the elytra more parallel, the underside entirely black and the furcate mark at base of thorax. I have taken quite a number of this species but all the specimens are remarkably constant in the furcate spot at base of thorax, which in none of the specimens shows any variation; even in a small, poorly developed specimen from New Braunfels, Texas, this mark is plainly seen, although faintly.

Clerus palmii, new species.

Moderately robust, form of *abruptus*, black, shining; at middle of elytra, a yellow transverse fascia nearly reaching the suture and a little irregular in outline, apex pubescent with white hairs. The punctuation of head, thorax and elytra, except towards apex where it becomes finer the same, the fasciæ are more sparsely punctured than the rest of surface. The pubesence consists of very short sparsely placed, scarcely visible white hairs, intermixed with longer and darker hairs, long and white at sides of thorax, base of elytra and legs. Length,

Senator, Arizona.

One specimen kindly given to me some years ago by Mr. Chas. Palm, whose name I have given to this species as a slight recognition of favors received.

Closely resembles the black forms of *abruptus*, but lacks the two basal spots of that species, the thorax in *abruptus* is much more finely and sparsely punctured than the elytra, while the punctuation of thorax in *palmii* is as coarse as that of elytra, the yellow fascia on the elytra

is always more or less curved down near suture in *abruptus*, while *palmii* has this fascia straight. The Nicaraguan *æsopus* seems to be very near to *palmii*, but has the fascia curved down near the suture and in addition a yellow oblique line near apex. *Clerus crabronarius* Spin. which it resembles also somewhat is a larger and more robust insect, with the elytra very coarsly punctured.

Hydnocera tricolor, new species.

General form of *discoidea*, but larger and a little more robust, red; elytra covering the abdomen, a white fascia behind the middle; apex black, clothed quite densely with moderately long dark hairs. Antennæ red, eyes prominent. Thorax red, wider than long, apex strongly constricted, below the constriction strongly arcuate, narrower at base than at apex, surface very densely not coarsely punctured. Elytra wider than the prothorax at base, slightly narrowing to the apex, humeri distinct, apices serrate, broadly rounded, disk more coarsely punctured than the prothorax, apex more densely, given the surface a more scabrous aspect, red to about the middle, apical third black, the red and black divided by a white fascia, the latter with white hairs, the rest of surface with very short pale hairs intermixed with darker and longer. Abdomen black, legs black except anterior femora which are red, the middle and hind femora red with the apex black, sometimes nearly the entire femora black. Length, 4–4.5 mm.

Brownvsille, Texas.

Types.—Four specimens in Museum of the Brooklyn Institute. By the coloration this is easily known from any of the described species.

Hydnocera omogera Horn.

This species occurred at different places near Brownsville quite commonly. It is as variable in size and in extent of the yellowish white markings as *discoidea*. The spots in the smaller specimens are as a rule more feebly developed than in the larger specimens, in the latter there is mostly another yellowish white spot of variable size at one third from apex. Specimens with an additional spot behind the middle were also taken in Lower California with the typical form by Mr. Beyer.

Pelonium maculicolle, new species.

Form and size of *Cregya vetusta* Lec.; testaceous, clothed with semierect pale hairs, thorax maculate with black, elytra with base more or less black, on each side about middle of disk three black spots, the two upper ones oblique and near the suture, the two lower ones generally confluent, a broad black fascia, narrower towards suture and irregular in outline, at about apical two fifth. Antennæ eleven jointed, half as long as the body in the male, shorter in the female, club longer than the preceding joints in the male, shorter in the female, last three joints black. Head coarsely, densely punctured, black, with a longitudinal pale line, variable in distinct-

ness, eyes prominent. Thorax nearly as long as broad, narrower at base than apex, sides gradually widening from apex to about basal third, then suddenly narrowing to base, disk slightly convex, even, with a slightly impressed median line, somewhat coarsely and densely punctate, a black median line and three or four spots on each side from the middle to the base, the spots at sides more or less confluent. Elytra nearly three times as long as the thorax, slightly widening towards apex, apices separately rounded, very coarsely, irregularly punctured, the space between the black median spots and the fascia devoid of these punctures, the base with a large black spot on each, below the humeral umbone a smaller one, sometimes connected with the basal spot, at about middle one oblique black spot on each side near suture, below this two others, mostly connected assuming a zigzag form, at about apical two fifth a broad black fascia of irregular outline, narrower towards suture. Anterior femora at apex and anterior tibiæ at base black, middle and hind tibiæ sometimes with a black fascia at middle. Anterior tibiæ serrate, in the smaller specimens faintly. Length, 7–11 mm.

Brownsville, Texas.

Types.—Four specimens in the Museum of the Brooklyn Institute.

I have taken a considerable number of this species, which is in my experience the most common Clerid in this region. It occurred mostly on *Acacia flexicaulis* and is a very slow insect. *P. bilineicolle* Chev. and *quadrisignatum* Spin. are allied to this species but the eleven-jointed antennæ and other characters separate it from these two; it resembles *P. amabile* Spin. also, but the markings, the form of thorax and the elytral punctuation are different in the two species.

The median impressed line of the thorax is variable in distinctness, below this line is also sometimes a more or less elevated smooth space.

The two genera *Peloinum* and *Cregya* are very feebly differentiated, in *Peloinum* the tibiæ are externally serrate and in *Cregya* smooth, these differences are in some way bridged over by the above described species, the serrulation is not very strong in the larger specimens but extremely feeble in the smaller ones, and undoubtedly the same will be the case in some of the Mexican or Central-American species. Large specimens of *Cregya vetusta* Lec. have the front tibiæ outside irregular, not smooth.

Enaplium granulatipenne, new species.

Elongate black, elytra covered with small granules, red with two large black spots on each side which are usually confluent. Head black, mouth parts red, densely cribrately punctured; antennæ reaching to the middle of the elytra in the male, first seven joints as long as the first joint of the club, black, the first 4 or 6 joints reddish beneath. Thorax a little broader than long, densely somewhat cribrately punctured, sides arcuate, parallel for a very short distance at apex; black, front and hind angles narrowly red. Elytra distinctly broader than the thorax at base, sides

slightly arcuate, widest at about apical third, apices separately rounded; disk slightly depressed, covered with small granules, transversely confluent at basal third, obliterated at basal region, which is more shining, red, with two large black spots on each side becoming largely confluent in most of the specimens. Underside and legs black, femora at base and sometimes the first ventral segment at sides, or the first two or three segments at sides and middle red. Length, 4.5–7 mm.

Brownsville, Tex. (Las Boragos). Types, six specimens in the Museum of the Brooklyn Institute.

The spotted forms resemble *quadrinotatum*, but differ by the densely and roughly sculptured thorax, and the first few ventral segments more or less red; *quadriguttatus* and *quadrinotatus* have the underside entirely black in all the specimens I have seen. I have taken about 15 specimens of this fine species on the flowers of the mesquite, but only a few with the spots well defined, in the rest these are confluent and in some specimens the elytra is black with a narrow space at base and side margin red. In regard to the distinctness of the two species *quadrinotatus* and *quadriguttatus* (if they are correctly identified) I have some doubt. In Dr. Horn's collection, as well as in all the others I have seen, the form with black thorax is *quadripunctatum* and with red thorax *quadrinotatum;* but there are intergrades which connect these.

Enoplium nigrescens, new species.

Elongate, red, with erect not densely placed hairs, antennæ, palpi, femora at apical third, tibiæ and tarsi black, each elytron with a broad black vitta, very distinct at base, but gradually fading into red towards apex. Antennæ longer than head and thorax, with the intermediate joints as long as the first two joints of the club, black, first joint beneath reddish. Head densely roughly punctured, sides straight at apical fifth. Thorax broader than long, then arcuately narrowing to apex, apical and hind angles rounded; disk slightly convex, very densely and moderately coarsely punctured. Elytra a little broader than the thorax at base, gradually widening to apical third, then arcuately narrowing to apex, apices separately rounded; disk feebly convex, coarsely cribrately punctured, punctures gradually but little smaller towards apex, a black broad vitta, very distinct and intense at base but gradually fading into red towards apex. Body beneath red, abdominal segments indistinctly fasciate with black, femora at apex, tibiæ and tarsi black. Length, 5 mm.

Brownsville, Tex. (Esperanza Ranch). One specimen in the Museum of the Brooklyn Institute.

In a specimen collected by Dietz the black vitta is more distinct than in the specimen taken by me and judging from this we may find specimens with the vittæ well defined from base to apex and going to the other extreme, specimens may be expected with entirely red elytra;

if I remember aright there is a specimen entirely red with Mr. Chas. Dury, collected in Arizona and it may belong here.

Elaphidion subdepressum, new species.

Brown, somewhat depressed, thorax very coarsely, at middle of disk in front confluently punctured, without callosities, pubescence very sparse, forming six denser spots, two in front of middle, two smaller behind middle, and one on each side at middle of sides; elytra sparsely pubescent with a somewhat arcuate fascia of denser white pubescence at middle. Head very coarsely, rugosely punctured. Antennæ as long as the entire body, brown, third and fourth joints with a small spine, joints slender, fifth to eleventh flattened, subangulate at apex. Palpi subequal, last joint triangular. Thorax as long as broad, somewhat depressed on the disk, sides arcuate, a little narrower at base than at apex; disk very coarsely punctured, in front the punctures are confluent, without callosities, very sparsely pubescent with white hairs, six spots of denser hairs, two situated at apical third, two at basal third, and two at sides at middle. Elytra broader than the thorax at base, punctuation very coarse and dense around scutellum, sparsely at sides, finer towards apex, which is conjointly rounded and without spines, a slightly arcuate fascia at middle, formed by more densely placed white hairs. Abdomen and femora more sparsely and finely punctate than elytra at base, sparsely pubescent. Length, 8 mm.

San Felipe, Lower California. One specimen from Mr. G. Beyer, in the Museum of the Brooklyn Institute.

The spinous antennæ, thorax somewhat depressed without dorsal callosities, apices of elytra and tibiæ without spines, place this species near *mæstum* Lec. from which it differs in much smaller size, thorax and base of elytra more coarsely and roughly punctured and the white elytral fasciæ.

Pentanodes, new genus.

Differs from *Tetranodes* Linell by having the eyes ovate, slightly truncate inside and in the male joints three to seven of the antennæ incrassate and clavate. The antennæ of the females have these joints simple.

Pentanodes dietzii, new species.

Reddish, a transverse ivory fascia at middle, apical half of elytra, abdomen and tibiæ black, very sparsely clothed with long hairs. Head moderately coarsely, densely punctured; eyes small ovate, slightly truncate inside, coarsely granulate. Antennæ as long as the body in the male, shorter in female, very finely pubescent, eleven jointed, first joint moderately stout, as long as the fourth, second small, third one third longer than fourth, third and fourth strongly incrassate, fifth and sixth subequal, each longer than fourth, incrassate, but less so than the third and fourth, seventh slightly smaller, clavate, narrower than any of the preceding joints. Thorax longer than twice the width, slightly longitudinally arcuate, densely longitudinally strigose; base constricted, with a transverse band of white hairs. Elytra slightly wider than the thorax, parallel, strongly depressed before the middle, at base on each side near suture a strong tuberculiform elevation, before the middle a transverse elevated ivory

vitta, attaining the side margin, but not the suture. The punctuation is very sparse, consisting of only a very few coarse punctures, each bearing a hair. Apex of metasternum with a band of fine white hairs. Femora strongly clavate, tibiæ slightly curved not carinate. Length, 5 mm.

Brownsville, Texas, two specimens, male and female in coll. Dietz.

The female has the antennal joints four to seven simple, but these joints are darker, otherwise it is exactly like the male.

Tetranodes niveicollis Linell.

Occurred commonly near Brownsville, Tex., on *Acacia farnesiana* and *flexicaulis*, but more frequently on the former. The female, which was not known to its describer, has all the antennal joints simple.

The following is the table of genera of the group Anaglypti as given in "The Classification" with the above mentioned or described genera added.

Group III. Anaglypti.

Second joint of antennæ equal to fourth.
- Antennæ not spinose, elytra without ivory spots..... *Microclytus.*

Second joint of antennæ short, third longer than fourth.
- Elytra without ivory spots.
 - Eyes oblique, emarginate..... *Cyrtophorus.*
 - Eyes entire, rounded..... *Tillomorpha.*
- Elytra with transverse ivory bands.
 - Antennal joints male and female slender, not inflated..... *Euderces.*
 - Four or five joints of male antennæ inflated.
 - Eyes emarginate, pointed behind; joints 3–6 of male antennae inflated, of female slender..... *Tetranodes.*
 - Eyes entire, oval. Male antennal joints 3–7 inflated, slender in female. *Pentanodes.*

Obrium brunneum, new species.

Elongate parallel very shining, brown, sparsely hairy. Head including the eyes smaller than the elytra at base, coarsely and densely punctate, a fine impressed median line, clypeal suture deeply impressed. Antennæ a little longer than the body, sparsely pubescent, first joint clavate as long as the second and third together, third and fourth equal, fifth to eleventh longer. Thorax about equal in length and width, strongly obtusely angulated at middle of sides, then obliquely narrowing to base which is constricted; disk flat, a vague, shallow impression on each side near the basal constriction surrounding a slight elevation, sparsely, moderately coarsely punctate. Elytra slightly widening towards apex which is broadly rounded, a little more coarser and closer punctate than the thorax, the punctuation confused, finer towards apex, sparsely pubescent. Abdomen sparsely, finely pubescent, legs sparsely clothed with longer hairs. Length, 7 mm.

Sta. Rosa, Lower California, one specimen from Mr. G. Beyer, in the Museum of the Brooklyn Institute.

Resembles closely the figure of *Obrium cribripenne* Bates in Biol. Centr. Am., vol. V., but while the elytra is brown in the figure it is according to the description "nigro-violaceis."

Differs from Linell's *mozinnæ* by the uniform brown color, the confused punctuation of elytra and the smaller head.

Both species *mozinnæ* and *brunneum* may be considered intermediate between the true *Obrium* and *Phyton* both have the apical part of thorax little wider than the basal part.

Neoclytus magnus, new species.

Elongate brown; thorax darker, at middle with a yellowish white fascia, base, apex and sides densely pubescent with white hairs; elytra with two straight and one oblique white fascia. Head very finely and very densely punctured, above the antennal tubercles and cheeks coarsely punctured, antennæ reaching the first elytral fascia, joints three and four slender, the outer joints shorter and broader and gradually decreasing in length. Thorax as long as broad, base and apex equal, sides slightly arcuate, disk moderately coarsely and densely punctured, with three rows of well defined transverse rugæ, one at middle and one on each side, below which the disk is depressed, those at side sinuate at middle and oblique at base. Elytra two and a half times as long as broad, narrower than the thorax at middle, sides nearly straight, slightly narrowing to apex which is arcuate truncate, the sutural angle rounded, the outer slightly acute. Beneath clothed with white hairs, denser at sides of prosternum, metasternum and abdomen, the latter finely and densely punctured. Legs long and slender, femora without spines, hind tibiæ and tarsi compressed, first joint of hind tarsi longer than the following ones together. Length, 20 mm.

Ensenada, Lower California. One female from Mr. G. Beyer in the Museum of the Brooklyn Institute.

Another specimen in Mr. Beyer's collection has the thorax and elytra blackish, the base of elytra reddish-brown and the bands yellow, but besides the color there is no other difference.

Ataxia spinicauda, new species.

Elongate, nearly parallel, piceous, elytra broadly, deeply and conjointly emarginate and bispinose at apex, covered densely with white and ochreous short hairs. Head densely clothed with white and ochreous hairs; antennæ nearly as long as the entire body, basal joints piceous, the following paler at base, densely pubescent with fine short white hairs, with larger hairs sparsely intermixed. Thorax nearly as long as wide, feebly narrower at apex than at base, sides slightly arcuate with a small spine at middle, disk finely and densely punctured, with a few larger punctures intermixed, a longitudinal impressed line interrupted at middle, densely clothed, white short hairs generally abraided at middle and two denuded round spots on each side near base. Elytra three times as long as the thorax, slightly narrowing to apex, apices conjointly, deeply, broadly emarginate and spinose; disk with a costa near suture, obliterated at base, finely and densely punctured, with a few coarse punctures

intermixed, densely pubescent with short white and ochreous hairs. Beneath and legs densely pubescent with white and ochreous hairs. Length, 9–11 mm.

Key Largo, Florida, two specimens from Mr. G. Beyer in the Museum of the Brooklyn Institute.

In form and sculpture like *crypta* but the pubescence is different and the apex of elytra is bispinose. According to the description it is similar to *A. spinipennis* Chev. from Cuba, but that is described as olivaceous, below irrorate with white and black, the thorax with a median longitudinal costa, length 19–20 mm. and is made the type of the genus *Prœcha* by Thomson.

Thryallis undatus Chev.

This fine insect occurred near Brownsville on the branches of a species of *Celtis* from April 15 to July 12, but is by no means common.

The genus *Thryallis* is a member of Lacordaire's group Anisocérides, included by Bates in his group Acanthoderini. The species of this genus are distinguished by their short, broad form, antennæ eleven-jointed in the male, ten-jointed in the female, with first joint attenuate at base, pyriform at apex, joints three and four very long, from joint six rapidly decreasing in length, the thorax is feebly tuberculate at sides. Lacordaire principally separates the Anisocérides from the Acanthodérides by the open intermediate cotyloid cavities, closed in the latter tribe, but according to Bates are not quite closed in *Acanthoderes* and allied genera.

Cryptocephalus arizonensis, new species.

Head, thorax and legs reddish, elytra blue, epipleuræ yellow from base to the middle. Head reddish yellow, front impressed on top, around the impression coarsely punctate, clypeal region smooth; eyes elongate, emarginate inside, antennæ longer than half the entire body. Thorax strongly transverse, convex, sides slightly rounded, basal angles sharp, prolonged backwards, base slightly arcuate, disk finely and densely punctate, with larger punctures intermixed, color red, basal margin narrowly bordered with black, basal angles yellow. Scutellum black, finely punctured, broader at base than at apex, at middle of base a deeply impressed fovea. Elytra as wide as the thorax, blue, with rows of large, deep, closely placed punctures, finer towards apex, regular on the disk and confused at sides, marginal and submarginal striæ regular at sides confused at apex, intervals flat, very finely punctate; epipleuræ yellow to the middle. Pygidium black, sparsely pubescent and coarsely punctate. Underside black, prosternum, sides of thorax beneath metasternum in front of middle and first abdominal segment between the coxæ yellow; prosternum convex at middle, lobed in front, not sinuate nor toothed near the front angles, bispinose and concave behind. Abdominal segments coarsely punctate, the punctures placed in one or two rows, sparsely pubescent, last abdominal segment with a broad round concavity pubescent around the sides with longer erect hairs. Length, 5.25 mm.

Pinal Mountains, Arizona, two specimens from Mr. Chas. Palm in the Museum of the Brooklyn Institute.

To be placed near *sanguinicollis* in Leconte's table from which the larger size, more robust form blue elytra with yellow epipleuræ will readily distinguish it.

Cryptocephalus atrofasciatus Jacoby.

Originally described from Mexico, Mr. Palm has specimens of this variable species from Globe, Arizona. The specimens with pale elytra and fulvous bands resemble superficially *fulguratus*, but are larger, more elongate and thorax distinctly punctate. The typical form has the elytra with three undulated black bands, but these bands become in some specimens more or less longitudinally confluent, of which the most extreme form which I have seen has the elytra black, with a few pale spots at base, two very small ones at apical third and the apex narrowly yellow, which goes even a little further than the variations observed by Mr. Jacoby.

Cryptocephalus quatuordecimpustulatus Suffrian.

Occurred frequently I believe on *Acacia flexicaulis* in Brownsville, Texas. It is about 3 mm. long, yellow, thorax nearly impunctate, elytra with striæ of not deeply impressed punctures, scutellar stria absent, sutural striæ short, obsolete at base, first stria united with the second slightly below the middle, joining the fourth at apex, fifth and sixth disconnected at middle, the lower part has the two striæ united at base and apex, the upper part of the two striæ is united at its apex by an oblique row of punctures, leaving between the two parts a slightly raised smooth space, the seventh and marginal striæ entire; the yellow color is divided on each elytron by brown bands into eight large spots, three at base of which the marginal spot is the smallest, two below these, then again two and at apex one. Abdominal segments somewhat coarsely and sparsely punctate.

Cryptocephalus brunneovittatus, new species.

Light yellow to fulvous, elytra with seven well defined regular striæ, first stria abbreviated at middle, scutellar striæ long, obliterated at base, alternate intervals more or less fulvous brown or rarely black. Head coarsely and sparsely punctured, an impressed median line not reaching the clypeal suture; eyes large elongate, broadly emarginate inside, antennæ reaching behind the middle. Thorax shining, convex, broader than long, sides slightly arcuate, narrowing to apex, hind angles prolonged, base arcuate, disk extremely finely punctured, with a few larger punctures intermixed, color yellow or fulvous, paler at base. Elytra about twice as long as thorax with regular rows of

somewhat deeply impressed, moderately large punctures, which become finer towards apex, scutellar stria long obliterated at base, first stria short, running to about the middle, second entire, joining the seventh at apex, third and fourth meeting at apex, fifth and sixth also joining at apex, seventh continued along apex and joining the second near entire, eighth or marginal stria continued around apical marginal to the suture by a few punctures, color yellow or flavous, alternate interspaces more or less brown, intervals nearly smooth, shining. Pygidium sparsely coarsely punctate. Prosternum nearly truncate in front broadly not deeply emarginate behind which causes the prolongation of the basal angles. Abdomen shining, punctuation not close, males with the usual large round impression on last segment. Length, 3–4 mm.

Brownsville, Texas, where it occurred at different places.

This species is to be placed near *defectus* with which it is confused in several collections, but the regular seventh stria will seperate it from that species, which according to the description has the seventh stria reduced to a small hook attached to the eighth in front of the middle. Although easily recognizable I was not able to find any description in the "Biologia" or in Suffrian's "Zur Kenntness d. N. A. Cryptocephalen," that would satisfactorily fit this insect. A moderately large number shows that the arrangement of the striæ is very constant, in all of the specimens there is not even the slightest attempt of a displacement or interruption of the seventh stria to be seen.

Fidia clematis, new species.

Brown, subopaque, pubescence cinereous, not very dense. Head moderately, coarsely, not densely punctured. Antennæ slender, piceous, joints three to six, paler at apex, outer joints black. Thorax nearly as long as wide, narrower in front than at base, sides arcuate, disk convex, moderately coarsely not closely punctured. Elytra about twice as long as the thorax, with rows of closely placed, but not very close punctures, intervals flat, finely transversely rugose. Body beneath brown, sparsely pubescent at middle, denser at sides. Legs a little paler, extreme apex of tibiæ and tarsi black. Length, 5–5.5 mm.

Occurred at Brownsville on different species of vines.

The color is variable which may be from very dark brown to fulvous. It is of the same form as *cana* but is more finely punctate, the pubescence is more cinereous, denser on the thorax and uniform, not forming a denser line at middle of thorax.

Fidia plagiata Lef.

This species occurs in Arizona, and has to be added to our list; it is easily recognizable from any of our species by the characters given in the following table:

Pubescence very fine, short and sparse, elytral striæ faintly impressed on the disk and at apex, intervals as coarsely punctate as the striæ; a longitudinal red stripe on

each elytron at sides, starting from base and extending to the middle, and a red spot at apex of variable size..... *plagiata.*

Pubescence longer and coarser, elytral striæ very distinct, color uniform.

Prothorax more finely punctured, color fulvous or brown.

Pubescence of head and thorax longer and coarser, head without a deeply impressed fovea, or with at most a faintly impressed short line, form shorter and a little more robust, color brown..... *clematis.*

Pubescence of head and thorax shorter, finer, head with a deeply impressed fovea at middle, color fulvous..... *viticida.*

Prothorax more coarsely punctured, color piceous or black.

Punctures of thorax very closely placed, pubescence of thorax, uniform, femora at base and sometimes the tibiæ pale..... *longipes*

Punctures of thorax well spaced, pubescence forming a denser line on the median line of thorax, legs black..... *cana.*

Myochrous magnus, new species.

Elongate, fulvous, with slight æneous tint, covered densely with yellowish scales. Head covered densely with yellowish and brown scales, concealing the surface sculpture, front longitudinally finely impressed. Antennæ pale, nearly twice as long as the thorax, joints three to six slender elongate, the last five joints broader. Thorax as long as broad, slightly arcuate and tridentate at sides, coarsely, closely punctate, covered densely with yellowish scales, lighter in color at sides. Elytra not quite twice as long as broad, with rows of large closely placed punctures, becoming smaller and confused at apex, the punctures larger than the interstices, covered densely with yellowish and brown scales. Underside coarsely, more sparsely punctured, covered not densely with yellowish white scales, which are more hair-like on the abdomen at middle. Legs stout, sparsely clothed with whitish scales, anterior tibiæ with a strong tooth at apical third ; tarsi broad and short, second and third joints pubescent beneath, third very densely with yellowish hairs. Length, 6.5–7 mm. ; width, 3 mm.

Brownsville, Tex., June.

Types. — Four specimens in the collection of the Brooklyn Museum.

M. longulus Lec. to which only this species can be compared is said to have the thorax longer than broad, but it will be found to be as given in the following table :

Thorax distinctly tridentate at sides.

Thorax wider than long ; vestiture of surface not dense, easily removed. *denticollis.*

Thorax as wide as long ; vestiture close and persistent.

Anterior tibiæ with a strong tooth below the middle ; larger species. *magnus.*

Anterior tibiæ without tooth, smaller species..... *longulus*

Thorax not dentate at sides..... *squamosus.*

Spermophagus eustrophoides, new species.

Oval ferruginous, clothed uniformily with ochreous hairs. Antennæ yellowish testaceous, subserrete, serration beginning with the fourth joint. Head oblong oval,

densely not coarsely punctate, a smooth median carina between the eyes more or less distinct. Thorax broader than long, sides arcuately narrowing to apex, which is truncate, surface sparsely and coarsely punctured with finer densely placed punctures intermixed, pubescence moderately dense and ochreous. Elytra oval, about one fifth longer than wide, sides slightly arcuate, apices separately rounded; surface deeply striate, punctate, intervals flat, finely punctured, clothed densely with ochreous hairs. Pygidium coarsly somewhat muricately punctate, moderately densely clothed with ochreous pairs, which from a denser line longitudinally at middle. Underside and legs concolorous densely clothed with ochreous hairs, finer and shorter on the legs. Hind femora with a blunt tooth on the inside one third from apex, hind tibiæ with two unequal long spurs, the outer one the longest. Length, 6 mm.

Lake Worth, Florida.

Six specimens, two in the Museum collection and four in coll. Dietz. They were all collected by the late Ottomar Dietz. It differs from *robiniæ* by the toothed hind femora, uniform vestiture and shorter, more oval form, in which it resembles some species of the Melandrid genus *Enstrophus*.

Bruchus julianus Horn.

This gigantic *Bruchus* occurred quite commonly in July on *Acacia flexicaulis*, in the large seed pods of which it undoubtedly breeds. The examination of the type saved me from describing this species again. Dr. Horn's types are small starved specimens 5–6 mm. long while my specimens range from 8–14.5 mm., 12–14 mm. being the average size, while only a few are of the smaller size. The deeply impressed median line, the uneven slightly sulcate surface of the thorax and the three dentiform elevations on each side of base of elytra on which I laid some stress and which Dr. Horn did not mention in his description, are only faintly indicated in the smaller specimens. I have distributed specimens under the manuscript name *flexicaulis*.

Bruchus arizonensis, new species.

Black variegated with white and ochreous pubescence; thorax elevated at middle and with a slight median groove. Head elongate oval, constricted behind the eyes, densely punctate, front carinate, around the eyes and sides of clypeus with moderately long, white hairs. Antennæ black, joints five to eleven suddenly broader than the basal joints. Thorax slightly companulate, disk very connex in front, behind the middle with two large tuberculiform elevations, these are separated by a median groove which does not quite extent to the apical or basal margins, surface densely clothed with white and ochreous hairs, summit of the two tubercles and the declivous front of the convexity black, devoid of pubescense. Elytra as long as broad, disk subdepressed, sides very slightly rounded, surface striate, striæ finely punctured, intervals densely punctate, flat, except the second which is slightly convex, variegated with white, ochreous and black densely placed hairs, the black hairs forming a con-

spicuous fascia at middle, irregular in outline, broad at sides and interrupted on the disk at the first and third striæ. Pygidium convex at apex, densely pubescent with white hairs, a transverse line of black hairs at middle. Legs piceous, tibiæ paler at apex, hind femur on the inner side near apex with a small tooth. Length, 3.5 mm.

Pinal Mountains, Arizona.

One specimen from Mr. Chas. Palm in the Museum of the Brooklyn Institute.

This species does not fit in any of the groups proposed by Dr. Horn, it is best placed near *mimus*, having the thorax similarly elevated and grooved, but has only one small tooth on the hind femur. In the specimen from the above named locality the pubescence on the apex of the pygidium is rubbed off, in another specimen from Yuma Co., Ariz., in my possession there are two short black lines on each side of the apex as in *prosopis* and the black transverse line at middle is only faintly indicated and the hind femora and tibiæ are more reddish.

Bruchus gibbithorax, new species.

Black, thorax and elytra densely clothed with white and ochreous hairs, black hairs forming large patches and lines on the elytra, thorax gibbous in front. Head elongate oval, clothed with white hairs concealing the surface sculpture, front carinate; antennæ black, joints five to eleven much broader than the preceding. Thorax convex, gibbous in front, densely clothed with ochreous and white hairs, an antescutellar spot of white hairs, front of the gibbosity black. Elytra about as broad as long, sides very slightly arcuate, disk striate, variegated with black, ochreous and white hairs; the ochreous and white hairs forming the general pubescence, the black forming distinct marks as follows: a large spot at humeral angle, a large broad fascia about middle, from the side margin to the third stria and a large spot at apex, between the humeral spot and the median fascia is a smaller spot situated on the second stria and a still smaller on the fourth stria, between the median fascia and apical spot is also a smaller one on the second stria, these two smaller spots situated on the second stria are connected by a line of white hairs. Pygidium slightly convex, densely clothed with white hairs. Underside densely pubescent with white hairs, concealing the surface sculpture. Femora reddish, tarsi black; hind femora with a small tooth.

Pinal Mountains, Arizona.

Two specimens from Mr. Chas. Palm in the Museum of the Brooklyn Institute.

This species can not be compared with any of our North American *Bruchus*; it is near *arizonensis* above described, but is very much smaller, the markings though similar are better defined, the median line and the two tuberculiform elevations of the thorax so prominent in *arizonensis* are not present here.

Bruchus texanus, new species.

Black, variegated with brown, thorax slightly tumid at middle near base, eyes very deeply emarginate. Head oblong oval, moderately coarsely densely punctured longitudinally carinate between the eyes, sparsely clothed with white hairs in the clypeal region, eyes very deeply emarginate, antennæ black, joints five to eleven much broader than the preceding. Thorax convex, slightly tumid at middle near base as long as broad, sides nearly straight, base sinuate, lobed at middle, apex truncate, surface densely clothed with brown and white pubescence, the brown predominating, an antescullar spot of white hairs, which fill out a slight impression. Elytra nearly as long as wide, striate, densely clothed with brown and white hairs, the brown more conspicuous in two large spots on each elytron, one at middle at sides, and on eat apex and one more indistinct oblique narrow one, from the humeri to the suture. Pygidium densely clothed with brownish and white hairs, the white more conspicuous in a longitudinal line at middle. Beneath and legs black, finely pubescent with white hairs, denser on the abdomen. Hind femur with a small tooth. Length, 2 mm.

Described from one specimen taken on May 2, at Esperanza Ranch, near Brownsville, Texas. Related to the two above described species but narrower, with entirely black legs and thorax not gibbous in front. The convex uneven thorax, the slight short median impression near base of thorax and the femora with one tooth brings this near *arizonensis*, with which it ought to form a separate group between Dr. Horn's Group II and III.

Some of the *Bruchus* may have been described from Mexico, but the descriptions are so extremely short, that it is very difficult to identify the insects satisfactorily.

Pelecotomoides nubilus Gerst.

A small number of this interesting Ripiphorid were beaten from different trees at Esperanza Ranch, most of them in July. Specimens are recorded from Panama as having "ill-defined transverse or oblong patches of a fuscous color" but all my specimens belong to the unicolorous form. This insect is of a grayish fuscous color, eyes large, divided in front by a very narrow line, antennæ with the first four joints simple, the remaining flabellate in the male, strongly serrate in the female. My specimens are from 5.5–9.5 mm. The genus *Pelecotomoides* is distinguished from *Toposcopus* by the entire eyes, which are in *Toposcopus* completely divided and from *Pelecotoma* by the strongly serrate claws. The following table will help in the identification of the Evaniocerini occurring in our fauna.

Eyes feebly emarginate.

Claws feebly bidentate, antennæ flabellate in the male or serrate in female from the fourth joint; hind tibiæ at apex with one small spur, third and fourth tarsal joints equal; eyes widely separated in front...*Pelecotoma flavipes* Wells.

Claws strongly serrate, antennæ flabellate in male, serrate in female from the fifth joint; hind tibiæ at apex with two moderately long sharp spurs, fourth joint twice as long as the third, eyes separated in front by a very narrow line. *Pelecotomoides nubilus* Gerst.

Eyes entirely divided by a broad plate.

Claws serrate, antennæ flabellate in the male, serrate in female from the fourth joint..... *Toposcopus wrightii* Lec.

Constrachelus rubescens, new species.

Blackish brown, sparsely clothed with white hairs, and denser reddish-yellow hairs at base of thorax, base and apex of elytra. Beak slender, curved, as long as the head and thorax, carinate at middle, striate at sides. Head coarsely punctured, clothed sparsely with reddish hairs which extend to the middle of the beak. Prothorax wider than long, slightly constricted in front, sides feebly arcuate, base bisinuate, disk carinate, densely rugosely punctured, clothed with white and reddish-yellow hairs, the first very sparse, the latter more densely near base. Elytra nearly twice as wide as the thorax, base sinuate, humeri broadly rounded disk with rows of coarse, closely placed punctures, alternate interspaces, carinate, carina of the third interval twice, but not abruptly interrupted, that of the fifth very feeble; surface blackish piceous, with irregular paler spots, clothed sparsely with white hairs and more densely at apex and base with reddish-yellow hairs. Abdomen shining, coarsely and sparsely, last ventral more densely punctured and with a shallow impression at middle. Femora armed with a small tooth, anulated with reddish-yellow hairs. Claws divergent, toothed. Length, 3.15–3.5 mm.

Brownsville, Texas (Esperanza Ranch, San Tomas). Four specimens in the Museum of the Brooklyn Institute.

The small size and the coloration will make this species easily recognizable from any of our *Conotrachelus*. It is intermediate between Leconte's Division I, *A* and *B* by having the costæ on the third interval interrupted and the femora unidentate. The species is not a common one, only a small number were taken during the entire time of my stay.

Chalcodermus semicostatus, new species.

Oval, convex, piceo-æneous, antennæ ferruginous, elytra strongly costate at apical half only. Head finely punctate, eyes nearly contiguous, separated by a very narrow line; beak as long as head and thorax, slightly curved, finely punctate, punctures slightly confluent at sides; antennæ inserted at middle. Prothorax slightly broader than long, gradually narrowing to apex, sides nearly straight, constricted in front, base bisinuate; disk coarsely punctate, denser and somewhat confluently at sides, intermixed sparsely with smaller punctures, at middle a narrow smooth median line. Elytra very little wider than the thorax at base, feebly narrowing to apex, humeri slightly oblique, disk with series of large not closely placed punctures, interstices sparsely punctate, very feebly convex at basal half, becoming strongly costate from about middle to apex. Legs stout; femora closely and coarsely punctate, with

a moderately long sharp tooth, tibiæ strigose punctate, slightly curved, front pair broadly dilated within about middle, middle and hind pair sinuate within near apex. Abdomen shining, coarsely not densely punctate. Length, 3.5–4 mm.

Four specimens, Brownsville, Texas (Esperanza Ranch), May, June and July, in the Museum of the Brooklyn Institute.

This species is very distinct from the North as well as the Central American species by the general form, strongly costate apical half of elytra and the punctuation of the prothorax.

Chalcodermus serripes Fåhr.

This species occurs from Brownsville, Texas to Brazil. It is easily distinguished by its narrow, somewhat compressed, elongate elytra and the tibiæ serrulate within. The color is æneocupreous, elytra rufous with a slight metallic tint, with rows of large punctures, and the thorax oblique-strigose.

Chalcodermus vittatus Champ.

Specimens of this species, which is described from Guatemala, were taken at Brownsville (San Tomas and Esperanza Ranch from May to July).

It is a short, oval insect, æneo-cupreous, elytra rufous, with the suture, the second interstice at middle, the fourth at apex and base, and the sixth for nearly the entire length, æneous. In one specimen the fifth at apex is also æneous. The thorax is oblique-strigose.

Toxotropis irroratus, new species.

Blackish brown, irrorate with yellowish white hairs on thorax and elytra. Head and prothorax densely punctured, the ante-basal ridge of the latter feebly arcuate, color blackish brown, with patches of white hairs. Eyes moderately deeply emarginate. Elytra with rows of moderately coarse punctures, intervals flat densely punctured, surface densely clothed with brown hairs, concealing the surface sculpture, irrorate with patches of white hairs, forming an irregular arcuate fascia near base. Body beneath black, moderate densely clothed with white hairs. Femora piceous, tibiæ and tarsi fulvous, the latter at apex black, claws deeply cleft, the inner portion convergent. Length, 2.5–3 mm.

Brownsville, Texas (Esperanza Ranch and San Tomas), April to June. Four specimens in the Museum of the Brooklyn Institute.

This species will readily be distinguished from our other species by the deeply cleft claws; the eyes seem to be also more emarginate. Both characters somewhat bridge over the differences between the genera *Toxotropis* and *Gonops*.

Toxotropis submetallicus, new species.

Blackish brown with a slight metallic tinge on elytra, clothed with brown, fulvous and white pubescence, the white forming a not clearly defined arcuate fascia near base and irregular fasciæ at apex. Head densely punctured, densely clothed with brown, fulvous and white hairs; eyes rounded, not deeply emarginate; antennæ short, black, nearly reaching to the basal carina. Thorax in its widest part broader than long, sides slightly arcuately narrowing to apex, ante-basal ridge arcuate forming a broad lobe at middle, surface densely punctured and clothed densely with white, fulvous and brownish hairs. Elytra not broader than the thorax in its broadest part, with rows of moderately coarse punctures, intervals flat, densely punctured, surface clothed with thin brownish, fulvous and white hairs, the white hairs forming on each side near base an arcuate fascia, one behind the middle and at apex not clearly defined. Beneath black, densely punctured, pubescence white, not very dense. Femora, apex of tibiæ and tarsi black, claws deeply cleft, the inner portion convergent. Length, 2.25 mm.

Brownsville, Texas (Esperanza Ranch and San Tomas, May and June). Four specimens in the Museum of the Brooklyn Institute.

This species is very close to the preceding but differs in the more arcuate transverse carina of the thorax, the eyes slightly less deeply emarginate and the pubescence much finer and sparser, which does not conceal the surface sculpture, permitting always the metallic tinge of the elytra to be visible; the white hairs form also more distinct fasciæ as in *irroratus* but are not very clearly defined. It has the same deeply bifid claws as *irroratus*.

Gonops fissunguis Lec.

I have taken a few specimens at Brownsville which agree with Dr. Leconte's description of this species as far as it goes.

Phanosolena, new genus.

Head as long as broad, beak emarginate in front, as long as the head. Antennæ longer than the body in the male, shorter in the female, inserted in cavities which are sublateral and visible from above, situated close to the eyes. Eyes small, moderately coarsely granulate, rounded. Prothorax nearly as long as broad, gradually narrowing to apex, ante-basal carina obtusely flexed at sides. Scutellum small. Elytra slightly wider than the thorax at base, convex, nearly twice as long as wide at base, apex conjointly broadly, but feebly emarginate. Legs slender, tibiæ and tarsi subequal in length, first joint of tarsi longer than the two following, second covering the third, of which only the lobes are visible, last joint elongate, claws bifid. Pygidium vertical, oval. Mesosternum short, metasternal episternum narrower at apex than at base.

Type. — Phanosolena nigrotuberculata.

The antennæ are not strictly laterally inserted, the cavities extending on the surface of the beak close to the eyes and are plainly visible from above. By the transverse carina being ante-basal this

genus is best placed in the Tropiderini, differing from all our genera of this tribe in the position of the antennal cavities.

Phanosolena nigrotuberculata, new species.

Black beneath, ochraceous above, variegated with black patches on thorax and elytra. Head as long as wide, beak as long as the head, emarginate at apex with the angles rounded; antennal cavities open, not covered by the sides of the beak extending slightly on the disk and situated close to the eyes. Eyes lateral, small, rounded. Antennæ longer than the body in the male, shorter in the female. Thorax nearly as long as broad gradually narrowing to apex, sides slightly arcuate, transverse carina ante-basal, obtusely flexed at sides, disk at middle pale, with a small tubercle, densely punctate, at sides black, surface clothed with ochreous and white hairs. Elytra twice as long as thorax, slightly wider than the thorax at base, apex conjointly broadly, but feebly emarginate, disk with rows of coarse, closely placed punctures, at base on each side of scutellum one large tubercle, the third costa behind middle for a short distance slighly elevated, color ochraceous, the two basal tubercles, the two costiform elevations, a large spot at sides and at apex black, pubescence yellowish white between the basal tubercle and the costiform elevation a line of white hairs. Femora in great part and tibiæ at middle black. Length, 2.5 mm.

Three specimens, Brownsville, Texas (Esperanza Ranch and San Tomas), in the Museum of the Brooklyn Institute.

Male antennal joints three to seven long, slender, equal among themselves, eight to eleven forming a club, the three last ones very small, the eighth slightly shorter than seventh, but widening to apex. Joints three to seven in the female slightly decreasing in length, the four last joints forming a club which is broader than that of the male.

Anthribus bipunctatus, new species.

Cylindrical, clothed with whitish, ochreous and black scale-like hairs, yellowish-white hairs more dense at base of elytra forming a band and extending along sides to middle, apex also paler and with a black sutural spot, thorax and elytra with erect brush-like tufts. Head and beak with white ochreous scales. Thorax as long as wide at base, slightly narrower and arcuate in front, nearly parallel behind, side margin extending to the middle, base slightly arcuate, disk finely and densely punctured, surface with white, ochreous and brown scale-like hairs; on each side near hind angles, a rounded black spot, three tufts of brown scale-like hairs transversely placed at middle, a line of denser yellowish-white hairs starting on each side of median tuft and divergent towards apex, a smaller oblique one near the outer tuft and meeting the median line at middle. Elytra with rows of coarse punctures, intervals finely punctate, vestiture whitish and ochreous, a row of three erect tufts of pale brown scale-like hairs and one nearer the apex but outside of this row, the distance between the first and second, and second and third equal, apex paler with a black sutural spot. Beneath moderately densely clothed with pale ochreous hairs. Tibiæ slightly annulated with ochreous and darker hairs and some longer pale hairs intermixed. Length, 4–4.25 mm.

Brownsville, Texas (Esperanza Ranch, and San Tomas). Two specimens in the Museum of the Brooklyn Institute.

Distinguished from any of our species by the black spots near basal angles of thorax, the divergent thoracic lines and the basal fascia extending along the sides to the middle of elytra.

Anthribus penicellatus, new species.

Cylindrical, clothed with white, ochreous and brown hairs. Thorax and elytra with tufts of erect hairs, the middle one of thorax black and long. Head and beak clothed with yellowish-white and ochreous hairs. Thorax as long as wide at base, narrower at apex, nearly parallel behind, base slightly arcuate, side margin extending to the middle, disk finely and sparsely punctured, covered with brown and ochreous hairs, three brush-like tufts at middle transversely placed, the middle one black and the largest, near the outer tufts denser white hairs forming arcuate indistinct lines, converging towards apex. Elytra parallel, declivous behind, with rows of coarse punctures, surface with white, ochreous and brown hairs, each side with three larger tufts in a row and some smaller ones at sides and apex, the median tuft yellowish white, the others brown, on each side of apex a small round black spot. Length, 3 mm.

Brownsville, Texas (Esperanza Ranch). One specimen in the Museum of the Brooklyn Institute.

Distinct from the other species by the absence of a large white spot or a fascia at base, the more declivous elytra at apex and the large prominent median tuft on thorax. The five species of *Anthribus* in our fauna may be separated by the following table:

Pubescence of thorax and elytra uniform, dense, yellowish gray, without erect tufts of scales.....*livndus*, Lec.

Pubescence grayish white, yellow and brown forming denser brush-like tufts on thorax and elytra.

Elytra with a well defined large transverse white spot in front of middle not extending to the side margins.....*cornutus*, Say.

Elytra with a more or less distinct basal fascia of dense white or ochreous hairs extending to the side margin.

Thorax without larger black spot near each hind angle, the middle and posterior tufts of hairs on the elytra more widely separated from each other than the first and second, the line of denser white and yellowish hairs convergent in front.....*vagus*, Horn.

Thorax with one black spot each side near hind angles, the distance between the first and second elytral tuft equal to that of the second and third, the lines of whitish and ochreous hairs at apex of thorax divergent in front.....*bipunctatus*, n. sp.

Elytra without basal fascia or spot, elytral tufts equidistant, middle thoracic tuft large and black, the arcuate lines convergent in front but very indistinctly defined at apex.....*panicellatus*, n. sp.

THE DEVELOPMENT OF WINGS OF CERTAIN BEETLES, AND SOME STUDIES OF THE ORIGIN OF THE WINGS OF INSECTS.

BY P. B. POWELL,

STANFORD UNIVERSITY, CALIF.

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INTRODUCTION.

The following paper contains the result of some investigations on the development of the wings of certain beetles and of an attempt to throw some further light on the primitive origin of the wings of insects.

This work, done in the entomological laboratory of Stanford University, was begun at the suggestion of Professor V. L. Kellogg and was carried on under his supervision, and to him my heartiest thanks are due for his many helpful suggestions and the great interest he has taken in my work.

That the wings of insects with a complete metamorphosis are present in the larva was known as far back as the time of Malpighi

(1767), while the beginning of our accurate knowledge of the manner of their development was made by Weismann (1864–6). Since his time there have been many workers in this field, but most of them have worked with the Lepidoptera and Diptera — orders in which the wing development is of a very complicated type, while on the Heterometabola and the more generalized of the Holometabola as the Coleoptera and Neuroptera, much less has been done. The only extended accounts of the development of the wings in the Coleoptera are those of Comstock and Needham (1899), Kruger (1899), Needham (1900) and Tower (1903).

In this paper I have traced in detail the development of the wings of two species of Scolytidæ or engraver beetles, *Tomicus plastographus* and *Dendroctonus valens* and have added some observations made on the development of the wings of a number of other beetles, the complete history of which I was unable to obtain. I have dealt only with the development of the wings in the larva, as it is probable that there is nothing in the pupal development of the wing that differs greatly from the accounts of Tower and others, or likely to have any bearing on the origin of wings. The second part of the paper is devoted to a discussion of the several theories that have been advanced to account for the origin of the wings of insects and the bearing that my observations have on the subject.

I. The Life History of Tomicus plastographus Lec. and of Dendroctonus valens Hopk.

Both these beetles belong to the family Scolytidæ and in some localities in California are so numerous that they do considerable damage to the Monterey Pine, on which they both feed.

The burrow made by the adult *T. plastographus* is some six inches in length and is three-branched, having something the shape of a Y, the entrance being at the intersection of the branches, one of which is considerably shorter than the others. The eggs are laid in little pockets along each side of the burrow and are tightly packed in with little chips of wood. In warm weather the eggs hatch in about one week. The larva bores a tunnel out at right angles to the parent gallery and becomes full grown in about two weeks. Pupation takes place in a cell at the end of the larval gallery and lasts about one week; so that a full life cycle is passed through in about four weeks. Breeding goes on continually throughout the year in this locality, but

during the winter months development is much slower. There are but two moults during larval life, *T. plastographus* being rather unusual in this respect, though Needham (1900) states that the larva of the flag-weevil, *Mononychus vulpeculus* has but two moults. The larva (Fig. 32) is a white footless grub. The eyes are lacking and the antennæ are reduced to a minute knob. The spiracles have no chitinous surrounding ring and are very hard to discern.

It may be well to mention here some observations I have made on the habits of this beetle of which I have seen no record. The male is apparently polygamous in its habits. As is usual in this family the work of making the burrow is shared by both sexes. In opening the galleries I found that there were generally three adults in each gallery, one at the end of each long arm and one at the center. Dissection proved that in each case two of these are females and one a male (when it was possible to determine the sex, it being very hard to separate the sexes after oviposition had taken place). I believe that the long arms of the gallery are made by the females, while the male makes the short arm and keeps a position near the entrance to the gallery, but I was not able to get positive proof of this. In some galleries however, there were but two beetles, a male and a female; occasionally there were four adults to a gallery.

The number of eggs laid in each pocket is variable; in the majority of galleries but one egg is laid in each pocket, but in a number of galleries examined several eggs had been deposited in each pocket, the number varying from two to seven — in no case was a pocket found with only one egg in it, while in those galleries with one egg to a pocket, in no case was more than one found in each pocket. The number of beetles in the gallery had no connection with the number of eggs in the pockets.

There is considerable variation in the size and number of the projections on the tip of the elytra, but this does not seem to be a sexual variation.

Dendroctonus valens forms a large irregular gallery under the bark and the eggs are laid loosely among small chips or shavings along one side of the burrow. This species works only at the base of the trees whereas *T. plastographus* works throughout the length of the tree.

After hatching, the larvæ feed on the sides of the gallery, enlarging it in all directions. The larva moults, I think, three times, but I am not absolutely sure of this point and it is possible there are

but two moults. In warm weather six to eight days elapse between each moult, the whole life cycle being passed in five to six weeks. The pupal period is passed in a cell of chips, formed in the gallery, and requires from a week to ten days.

The general appearance of the larva (Fig. 33) is much the same as the larva of *T. plastographus*, but it is larger and each spiracle is surrounded by a chitinized cresent, below which, on the abdominal segments, is a large oval chitinized disc or tubercle. There is also a strongly chitinized caudal plate on which are a number of short stout spines.

II. Development of the Wing.

1. *Formation and Growth.*

(*a*) *Early Stages.* — The wing fundament, in all the Holometabola and probably in all the Heterometabola as well, becomes first recognizable as a slight thickening of the hypodermis on the pleurum of the meso- and metathorax (Figs. 1, 2, 18). In the larvæ of *T. plastographus* and *D. valens* the cells that are destined to form the wing begin to be differentiated from the rest of the hypodermis sometime during the middle or latter part of the penultimate stage, the time of first appearance varying somewhat in different individuals. This thickening increases in size towards the end of the penultimate stage and extends the greater part of the length of the segment as an oval disc, becoming thinner on the edges and gradually merging into the hypodermis. The cells become quite crowded together and elongate and the nuclei come to lie at several levels in the disc.

Just before the last moult the outer surface of the wing disc becomes thrown up into prominent folds and ridges (Figs. 3, 23) due to the compression of the growing hypodermis by the old chitinous covering. This folding and ridging of the hypodermis takes place to a greater or less extent all over the body, but it is most pronounced in the rapidly growing cells of the wing disc. The cells of the disc are now quite long and narrow and there are traces of what later becomes very pronounced — a narrowing and elongation of the bases of the cells so that they become almost thread-like (Fig. 3). The degree of this separation, however varies in different individuals. The cytoplasm of the cells also seems to become thinner or lighter colored near the center of the inner surface of the disc. After moulting, the folds and ridges disappear from the surface of the wing

disc (Fig. 6) and the hypoderm, by the expansion of the body after becoming free from the old cuticle. There does not seem to be any sudden and great proliferation of the cells of the disc just before moulting, as was found in the Lepidoptera by Verson (1904) and the growth of the wing appears to be even and constant up to the prepupal period, when it becomes accelerated.

(*b*) *Types of Wing Development.* — Tower (1903), working on the development of the wings in Coleoptera, found three types of wing development present in that order, which he designated as the simple, the recessed and the enclosed. The simple type, in which the wing merely evaginates and lies between the cuticle and the hypodermis, he found to be the prevailing type among the Coleoptera. The recessed type he found only in the Scarabæidæ. In this the disc first invaginates, then evaginates and lies in the shallow open pocket thus formed. This is the type found by Gonin in the Dipteron, *Corethra*. In the third, the enclosed type, after the invagination the opening becomes closed and the wing evaginates downward into a closed sack, formed by the lower wall of the invagination. This type was found by Tower to occur in the Coccinellidæ and the Chrysomelidæ. There are two other types, which have been found only in the Diptera, the stalked and the detached. They are similar to the enclosed type except that the walls of the invagination in the stalked type become very thin and the evaginated part, which forms the wing, is pushed well into the body cavity, while in the detached type the wing bud is entirely separated from the hypodermis and lies free in the body cavity.

In all the Coleoptera, according to Tower (1903), after the wing disc becomes well thickened, a pit-like invagination forms in the center of the disc, which rapidly widens into a groove extending nearly the length of the disc. In those insects in which the wings develop within the body, this invagination becomes much extended and the hypodermal layers thus extended form the peripodal sack into which the wing is evaginated. Tower found this primary evagination forming, even in those beetles which have a simple type of wing development. I find, however, that in both *T. plastographus* and *D. valens* this primary evagination is not formed. The only other record among Coleoptera in which the wing evaginates without this preliminary invagination is that of Needham (1900) in the flag-weevil (*Mononychus vulpeculus* Fab.).

(*c*) *Evagination of the Wing.* — During the middle of the last stage, in *T. plastographus* and *D. valens*, the evagination of the disc to form the two layers of the wing takes place. Up to this time the wing disc has been more or less convex on its outer surface and nearly straight on its inner surface and thickest in the center (Fig. 6). In the wing of an undetermined Buprestid, however, the convexity of the disc is on the inner surface (Fig. 18). The cells of the lower part of the disc now begin to elongate and push outward and downward so that the thickest part is near the lower edge (Fig. 4). At the same time there begins a slight pushing in of the cells at the lower edge of the disc (Fig. 34). Thus we have a double process going on in the formation of the wing, an evagination of the cells downward and an invagination pushing the lower edge of the disc upwards and inwards, so that the apex of the future wing is soon formed. This same process takes place in *Bruchus* sp. and in an undertermined Buprestid (Figs. 19, 20, 35, 37). Below the apex of the wing there is formed a prominent spur or projection of the hypodermis. This projection persists and is recognizable until near pupation, when the wing begins to elongate greatly and become folded under the cuticle. The bases of the cells near the center of the disc now become greatly narrowed and separated from each other, soon becoming almost thread-like. These narrowed bases become quite distinctly demarcated from the rest of the cells and the nuclei, since they taper quite abruptly so that a wing at the stage shown in Fig. 38 appears at the first glance to have a large lumen, but a careful examination shows that, in *T. plastographus* and *D. valens* as well as in several other beetles examined, the basement membranes of the two sides of the wing are more or less closely pressed together, though not fused. During the early stages of the formation of the evagination, the basement membrane sinks in near the center of the disc, then becomes folded on itself and pushes out into the elongated bases of the cells as a double sheet extending nearly the length of the disc. The different stages of the elongation and narrowing of the cells and the formation of the wing cavity by the evagination of the basement membrane into the disc, coincident with the pushing downward of the apex of the wing can be seen in Figs. 7, 19, 35, 36, 38. Fig. 38 shows the stage of development reached by the wing about the beginning of the prepupal period, at which time tracheæ and tracheoles begin to push into the wing and the vein cavities are formed. This method of develop-

ment of the wing, though described from *T. plastographus* applies equally well to the Bruchidæ (*Bruchus* sp.) and to certain of the Buprestidæ as well as to *D. valens*.

With the growth of the wing downward there is a corresponding pushing upward of the invagination at the lower edge thus bringing the wing outside the body, between the hypoderm and the cuticle, while the increase in the size of the body keeps pace with the growth of the wing, so that, although the wing is constantly growing downward and increasing in length, it does not push past the spur or projection in the hypoderm below it until that disappears by the stretching of the hypoderm, late in the prepupal period.

(*To be continued.*)

Class I, HEXAPODA.

Order IV, DIPTERA.

BRIEF NOTES ON MOSQUITO LARVÆ.

By HARRISON G. DYAR, A.M., PH.D.,

WASHINGTON, D. C.

LARVA OF ANOPHELES BARBERI COQ. — Mr. H. S. Barber originally obtained eggs of this species at Plummer's Island, Md., and turned them over to the Bureau of Entomology, from whence I received them and carried one to the last stage. This was late in the fall and the larvæ were lost over winter. Their actual occurrence was unknown to us. Last summer Mr. F. C. Pratt had the good fortune to discover the larvæ in water in hollow trees at Trapp, Loudon Co., Va. (July 25, 1904). They were taken in charge by Mr. F. Knab, who informs me that in addition to feeding with the mouth brushes in the usual way, the larvæ were predacious, seizing *Culex* larvæ with great activity. This remarkable habit for a larva that can exist on a vegetable diet was observed both by Mr. Knab and Mr. Caudell. Their natural prey are apparently the larvæ of *Culex triseriatus*, *C. signifer* and *C. restuans*, the first two of which inhabit normally hollow trees, the last has been so found by Mr. Pratt.

Larva. — Head elongate, rounded, narrowed before; eye very small, round; antennæ short, not exceeding the mouth, all brown-black. Body as usual, hairs of first two abdominal segments long and branched; the others markedly shorter; dorsal fan shaped tufts present on segments 3–7, but small and with the branches filiform. Air tube sessile, projecting backward over the anal segment, the comb on the side of the eighth segment with 12 long, stout teeth, all practically equal in length without any short ones interpolated. Anal segment with a heavy dark plate reaching half way down the sides: dorsal tuft of four branched hairs, ventral brush of long plumed hairs somewhat curved, the barred area surrounded by a chitinous rim, which runs narrowly to base on ventral line.

VORACITY OF PSOROPHORA CILIATA FAB. — Some forty young larvæ of *P. ciliata* were collected from a temporary roadside puddle at Grassymead, Va., together with an equal number of *Culex jamaicensis* on June 11. They devoured all the *jamaicensis* and had begun to eat each other by the next morning. A large culture of *Culex atropalpus* was given them, which they despatched before night of the twelfth and began to eat each other again. As their numbers were being seriously reduced by their cannabalistic habits, they were then separated in jars and fed a mixed culture of *Culex restuans* and *C. pipiens* from a water barrel. Development was very rapid, pupæ being obtained by June 18.

LARVA OF TÆNIORHYNCHUS SIGNIPENNIS COQ. — This species was bred at Laredo, Tex., by Dr. T. D. Berry. The larvæ were found in a puddle two days after a rain, pupæ were formed on the fourth day and imagoes on the fifth. The larvæ are very closely allied to *Culex jamaicensis*, differing only in minor details. Their mode of occurrence and rapid development are likewise similar. As compared with *jamaicensis* the upper two hair tufts of the head are single hairs, not tufts of five or six; the antennæ are all pale whitish, not with the terminal two thirds black; the four spines of the air tube are very basally placed, not remotely spaced to reach nearly half the length of the tube. There are other smaller differences.

OCCURRENCE OF CULEX AURIFER COQ. — The note with this heading printed on page 172 of this Journal as in fault, owing to a misreading of Mr. Brakeley's letter. He now writes me that it was the adults, not the larvæ, that occurred in the fore bay (erroneously printed "five boy") of his dam. I have taken the adults sparingly at Weekapaug, R. I., near some cold springs in pasture land, in July. The larvæ had, of course, all disappeared before that date.

SYNONYMY OF CULEX TRICHURUS DYAR. — This species has been

redescribed by Messrs. Felt and Young (Science, n. s., xx, 312, 1904), under date of September 2, one day latter than the date of issue of this Journal. They called it *C. cinereoborealis*. Dr. Felt has very kindly transmitted to me a specimen of the larva of his species and there is no doubt of its identity with my *trichurus*.

LARVA OF CULEX PULLATUS COQ.— This is the species called *Culex impiger* in my article on British Columbian mosquitoes (Proc. ent. soc. Wash., vi, 37, 1904), which was the most abundant species at Kaslo, B. C. As noted, the larva is closely allied to *canadensis*, differing only in minor details, whereas the adult is very different. Of the first stage, I made the following description:

Larva, Stage I. — Head elliptical, rounded, the mouth large, quadrate, with well developed brush; eyes elongate elliptical. Thorax rounded, enlarged, abdomen submoniliform, hairs moderately long, single, the lateral ones double on segments 1–4, gradually becoming shorter and weaker posteriorly. Lateral comb of the eighth segment a single row of short, stout, pointed-tipped spines. Air tube three times as long as wide, conical at tip with short, simple basal pecten and hairs beyond. Anal segment with dorsal tuft, paired, two hairs in each half; no ventral brush. Four anal processes longer than the segment.

CULEX ÆSTIVALIS, NEW SPECIES. — I propose this name for the species called *Culex reptans* in my article on British Columbian mosquitoes (Proc. ent. soc. Wash., vi, 38, 1904). It is clearly not the European *reptans* (*nemorosus*), nor is it *lazarensis* Felt & Young, which has a peculiar larva that I had not seen till I examined a specimen kindly sent to me by Dr. Felt. The larva of *æstivalis* is characterized by the air tube being about three times as long as wide, the pecten without detached teeth, followed by the tuft; anal segment almost completely ringed by the plate, the barred area running nearly to the base, two tufts before it practically reaching base; comb of the eighth segment a large patch of thorn-shaped spines fully three rows deep.

SYNONYMY OF CULEX PUNCTOR KIRBY. — As this form has been identified by Mr. Coquillett and myself, it is identical with *Culex absserratus* of Felt & Young (Science, n. s., xx, 312, 1904), as I learn from an examination of their specimens. If we are correct in our identification of Kirby's species, *absserratus* will be cited as a synonym thereof. The larva is characteristic by the smallness of the comb of the eighth segment and the complete encircling of the anal segment by its plate (Journ. N. Y. ent. soc., xii, 169, 1904, pl. ix, fig. 1).

IDENTITY OF CULEX FITCHII FELT & YOUNG. — This is the form described as "*cantans* 2" by Mr. Knab and myself (Proc. ent. soc. Wash., vi, 143, 1904). Whether the European *cantans* Meig. really occurs in America at all is a question we are unable to decide at present, and if it does, it is as likely to be *fitchii* as the form "*cantans* 1." European larvæ must be compared.

THE EGGS OF CULEX TERRITANS WALKER.

BY FREDERICK KNAB,

URBANA, ILL.

During the summer of 1903, in examining rain-barrels for mosquito material, egg-clusters were several times found upon the sides of the barrel some distance above the surface of the water. At first it was thought that these egg-boats had come into that situation by some disturbance of the water, but later a number of them were found in the same barrel and at different heights from the water — some of them six or eight inches above the water-level. It was also noticed that the longitudinal axis of the cluster was always vertical and there could be no doubt that the eggs were deposited in that situation. These egg-boats were easily detached and when placed in water floated in the ordinary manner of the eggs of *Culex pipiens* and *Culex restuans* and the eggs hatched within a day. The larvæ from these eggs proved to be those of *Culex territans*, which was also the most abundant form in the barrel in question. It may be added that this rain-barrel stood in a large and well-shaded picnic grove and nearby were several small ponds fed by springs where the larvæ of *Culex territans*, and of that species only, were abundant. Upon a previous occasion four egg-boats of *Culex territans* were found at the margin of one of these little ponds. They were under a projecting tussock attached to its base just above the surface of the water. Doubtless the eggs find their way to the surface of the water by some mechanical means and most likely are washed down by a heavy dew or a rain. Probably they do not hatch until they reach the water.

Upon August 16, 1904, it was my good fortune to come upon a mosquito of this species in the act of ovipositing. In the above mentioned grove was a discarded dish-pan partly filled with rain water

and upon its steep side the mosquito was depositing its egg-cluster. About half the eggs were already laid. The mosquito sat face upward, the tips of her hind legs just touching the edge of the water. Her legs were placed well apart in the ordinary resting attitude, her abdomen turned abruptly downward. A very slight backward and forward motion of the abdomen could be discerned as the eggs were extruded in rather quick and regular succession. The last half of the cluster was laid in about eighteen minutes — from 10.45 to 11.03 in the forenoon. The manner in which the eggs are extruded and placed against the preceding ones is remarkable.

Although the abdomen is bent almost straight downward, the mouth of the ovipositor is turned dorsally and upward so that the egg, which appears with the tapering end foremost, is pushed upward along the dorsal side of the abdomen until nearly the entire egg is exposed. A slight backward motion of the abdomen then pushes the egg against the cluster, the basal part of the egg being first brought in contact. When oviposition was completed the mosquito walked slowly up the side of the pan and was then captured.

The completed egg-cluster contained 132 eggs laid in eight very regular rows with the slightly curved eggs all turned in the same direction. Only at one end of the cluster, that towards which the eggs are curved, and its beginning, I judge, the regularity of the arrangement is broken. The number of eggs in each row was as follows: 11, 16, 18, 19, 19, 19, 18, 12. The egg is cylindrical, about four times as long as broad. The lower end is spherically rounded; the upper third tapers very gradually, is slightly curved and ends in a blunt point. The color, by direct light, is brownish gray, darkening at the tip. The surface of the egg appears smooth but under a high power is seen to be very finely and rather closely granulate. Along the sides are traces of the secretion by which the eggs were fastened together. The eggs adhere together quite firmly and it is only by some little force that one of them can be detached. As a result of the slight taper and curvature of the eggs towards the top the cluster is slightly convex at the bottom. Before hatching the eyes of the larva show through as two dark red spots about one fourth above the base of the egg and the segments of the larva may be also faintly discerned. The eggs when first laid are pure white, shining, and darken very slowly. When examined three fourths of an hour later (11.50) they were still white and an hour after this (12.50) they were just tinged

with blue-gray. Two hours later (2.50) they were of a gray such as that of the freshly broken surface of cast iron and at 4.20 they were a dark iron gray and had not yet attained their full coloring.

Upon the same day, at 1.25 p. m., a second mosquito was found ovipositing close by the first egg-cluster. Over one third of the eggs were already laid. The attitude and behavior of this mosquito were much like those of the other one. The hind legs, however, were placed closely along the sides of the egg cluster, while in the other mosquito they had been well apart. It is quite possible that the hind legs are crossed in the beginning to receive the first few eggs, as Réaumur has observed in *Culex pipiens*. The second mosquito concluded her egg-laying in 15 minutes and flew suddenly away. The egg-cluster was more elongate and straight-sided than the first one and contained 105 eggs in six rows. The number of eggs in the rows was: 6, 21, 21, 21, 20, 16.

The day upon which these observations were made was warm and partly cloudy.

My experience in western Massachusetts has been that, aside from the species frequenting rain-barrels, *Culex territans* is the only species of *Culex* breeding continuously and in numbers throughout the summer. It frequents pools in the woods with clear cool water and ditches with a slight current. I have also found a few of the larvæ in a clear mountain spring. The attitude of the larva when at the surface is very characteristic and enables one at once to distinguish it from closely related forms. The breathing tube is vertical while the body is horizontal in position. In all other forms that I have seen the body inclines downward at a greater or less angle.

The eggs of *Culex territans* have been noted by Dr. Dyar (Science, n. s., xvi, 672, 1902) who says "they are laid in little groups of two or three side by side." It is obvious, however, that he observed only the parts of a cluster that had become broken apart after hatching.

Class I, HEXAPODA.

Order V, LEPIDOPTERA.

POISON IVY CATERPILLARS.

By HARRISON G. DYAR, A. M., PH.D.,

WASHINGTON, D. C.

Two similar Pyralid larvæ may be found on poison ivy leaves, living solitary in a loose open web, by which the leaves are more or less folded or united. They rest in the web, not on the leaf, and are conspicuous by their bright colors. Both were known to the late Dr. C. V. Riley, though I do not find that he ever published descriptions of them. He confused the two species, as is evidenced by his giving them both the same number. One of them, perhaps both, were seen by the late Dr. Geo. D. Hulst, and he refers to one in a very brief and inadequate manner (Ent. Amer., v. 52, 1889). Last summer at Weekapaug, R. I., I found poison ivy very abundant and had the opportunity to observe both species. I made the following notes:

Epipaschia superantalis Clemens.

Eggs. — Elliptical, flat like the eggs of Cochlidiidæ, laid singly or in small groups a little overlapping, 1 × .6 mm. in size. Opaque pale yellowish, with a narrow clear rim; surface dull, densely coarsely reticulate with rounded raised lines, appearing somewhat granular. On the next day the embryos had developed and the eggs were suffused with pinkish-red. Hatched in nine days.

Stage I. — Head held flatly, whitish with a smoky brown band on the sides continuing the lateral line of the body and a mark bordering the clypeus. Body slender, straight, whitish colorless, distinct subdorsal and lateral vinous brown lines running the whole length, narrow, sharp. Feet normal, concolorless, the anal ones lined by the lateral stripe. The subdorsal line is elliptically remote on joint 2. The larvæ sat on the back of a leaf on a loose web, free of the leaf and lying parallel to the veins.

Stage II. — Head greenish luteous, a black band on each side and an abbreviated v-mark over the clypeus; width .4 mm. Body slender, greenish, greener dorsally; a broad black-brown lateral band composed of the subdorsal and lateral lines being joined by an interpolated lateral line. Anal feet reddish lined, outstretched; other feet pale.

Stage III. — Head .6 mm., as before, white with black marks. The anal feet are black lined above.

Stage IV. — Head white over the clypeus and a dot at the apex of each lobe, the rest black; width 1.05 mm. Body yellow dorsally, with traces of a dark dorsal line intersegmentally; sides black, enclosing the narrow white lines that divide the black

nearly evenly, the upper third being rather the broadest. Below waxy white, feet pale, anal feet dorsally black lined.

Stage V. — Head black, a bright white spot in the clypeus, dot on paraclypeus and long spot each side of clypeus; width 1.5 mm. Dorsal band orange; sides black with light blue lines approximate in the center; subventer pale yellow, venter and feet whitish, anal feet black above. No shields.

Stage VI. — No change; width of head 2 mm. When mature, the larvæ became orange colored and entered the earth to pupate. They formed cocoons of sand and silk.

Food plants, *Rhus radicans*, *Rhus vernix*.

Epipaschia zelleri Grote.

Stage IV. — Head rather elongate, held flatly, luteous, shining, a broad light red, slender band on each side, cut into angular spots; width one mm. Body slender, tapering posteriorly, anal feet divergent; joint 2 light red like the head with pale lines of the body; anal feet with dorsal dark red stripe. Body light green, four yellowish white lines in dorsal space; lateral area broadly black, cut by a faint filiform pale line above and the lower edge separated to form a suprastigmatal line. Traces of a subventral black line on the thorax in spots; feet pale, concolorous. Tubercle iii of joint 12 in enlarged and pale, else tubercles small and obscure, concolorous; setæ moderate, pale, iv + v.

Stage V. — Without change. Width of head 1.5 mm.

Stage VI. — Head light red with pale freckles; width 2.2 mm. Body yellow, dorsal line blackish, addorsal line gray; sides black with faint white line above and more distinct one below. Venter whitish, with traces of a subventral blackish line on thorax. Joint 2 light red; anal feet dark red. The larvæ entered the earth of spin.

Food plant, *Rhus radicans*.

CHANGE OF NAME (*Mesoleuca*) OF A GENUS OF HEMILEUCID MOTHS. — In my article "New generic types of bombycine moths," published in this Journal, vol. xi, December, 1903, I proposed the name *Mesoleuca*, for a new genus of Hemileucidæ. The name, however, as Dr. Dyar kindly informs me, is preoccupied by Hübner's genus of Geometridæ. I accordingly beg leave to change the name to *Meroleuca* (Gr. μέρος, part; λευκός, white). The two names are sufficiently distinct to prevent confusion.

A. S. PACKARD.

Class I, HEXAPODA.

Order IX, HEMIPTERA.

A LIST OF CERTAIN FAMILIES OF HEMIPTERA OCCURRING WITHIN SEVENTY MILES OF NEW YORK.

By J. R. de la Torre Bueno,

New York, N. Y.

The list of Hemiptera that I now present is necessarily not as complete or as perfect as it might have been had I collated authorities and gone into an extensive examination of other collections than Mr. Davis's and my own. In publishing this list I am moved by two considerations: first, that outside of the work done by Mr. E. P. Van Duzee about Buffalo, similar work has not been attempted elsewhere in the state to my knowledge, and, consequently, any records bearing on the Hemipterous fauna of this vicinity, however isolated they may be, cannot be valueless, at least in helping for the moment other students of distribution and the problems involved; and later it may be serviceable to some slight degree as a foundation for the extensive and complete list that there should be of the entomological fauna of New York State; second, that in making these records I wish to preserve in a much more permanent form than pinned insects the fruit of my collecting. It seems to me almost trite to say that printer's ink will last longer than pinned bugs. Then, also, this list would be more accessible to distant friends than would my boxes.

The deficiencies of work of this nature are inseparable from its character. A list is a list. It cannot be a synopsis, neither can it be a key for the determination of species, nor can it legitimately be criticised because it is not a handbook. As a mere enumeration of forms occurring within certain definite limits a list is of intrinsic value in the study of the distribution of species, with which many of the most momentous problems of economic entomology are bound up. That this is a rational view of the matter is attested to by what American entomologists of repute have said about it in their writings. Professor Herbert Osborn referring to this says: *

* "Remarks on the Hemipterous Fauna of Ohio, with a Preliminary Record of Species." Contrib. Dept. Zool. and Ent., O. S. U., No. 2. Ohio State Acad Sci., 8th Ann. Rep., pp. 60–79.

"If there is any need of an apology for the study of a local fauna, it would seem to be sufficient to call to mind the numerous problems of geographical distribution, life zones and dispersal that are presented by every group of animals and for the solution of which complete records of local faunæ become indispensable. At first sight it may seem less essential to secure such records from the different parts of a large area having primarily one faunal zone; but the facts reveal that in many cases the distribution of particular species presents peculiar limitations, and the recognition of these is essential in any consideration of more general groups. While the study of remote and exceptional localities may give more striking and immediate results an extended and systematic study of particular groups must be the basis for final conclusions regarding many of the more obscure laws."

On the same subject, Mr. Edward P. Van Duzee says:* "The publication of faunal lists constitutes a very important element in the literature of entomology as well as in that of other branches of Natural History. They form the basis of our studies on the geographical distribution of species and throw much light on the origin of our fauna and its relation to that of other countries and zoögeographical regions."

Of recent years, quite a number of local lists of Heteroptera have been published, among them, in addition to the two quoted from, the following by Prof. Osborn, "Contributions to the Hemipterous Fauna of Iowa," Proc. Ia. Acad. Sci., Vol. IV., and "Additions to the List of Hemiptera of Iowa, with Descriptions of New Species," Proc. Ia. Acad. Sci., Vol. V. Mr. Van Duzee has also published "Hemiptera of Beulah, N. M.," in Trans. Am. Ent. Soc., XXIX, March, 1903. There are in addition to these, "Preliminary List of the Hemiptera of Colorado," by Prof. Gillette and C. F. Baker, Bull. 31, Tech. Ser. I, State Agr. Coll. Exp. Sta., Ft. Collins, Col., 1895, and a number of partial lists by Prof. Uhler, which it is needless to recite. The list of Hemiptera contained in Prof. Smith's New Jersey List, so well known and appreciated by local entomologists, and last, but certainly not least, Prof. Uhler's "Check List," may also be cited.

I am indebted to Mr. Otto Heidemann for determinations in Coreidæ and Aradidæ, and to Mr. E. P. Van Duzee for the Penta-

* "A List of the Hemiptera of Buffalo and Vicinity," Bull. Buff. Soc. Nat. Sci., Vol. V, No. 4, pp. 168–204.

tomidæ. All other determinations are by me, except as noted. My good friend Mr. W. T. Davis, has been of great assistance by permitting me to take the records from his local collection, which is certainly a very full one and contains many of the insects noted further on from unusual localities.

The families Lygæidæ, Capsidæ,* Acanthiidæ, Tingitidæ, Reduviidæ and Corixidæ are omitted, either by reason of scant material, or because, as in the Corixidæ, there exists a great specific confusion. Those enumerated are taken in order, according to the more commonly accepted classifications, commencing with the highest and ending with the lowest. Such changes in nomenclature as are made will be explained where they occur.

(*To be continued.*)

Class III, ARACHNIDA.

Order III, PHALANGIDEA.

NOTES ON SOME PHALANGIDS COLLECTED NEAR ITHACA, N. Y.

BY CYRUS R. CROSBY,

PENN YAN, N. Y.

The two following new species of Phalangids I place in the genus *Caddo* Banks although they differ from *C. agilis* Banks, its type, in characters which Banks considered generic. Both species have the abdomen more distinctly segmented above and *C. glaucopis* has only two spines on the base of the femur of the palpus.

Caddo glaucopis, new species. (Fig. 4.)

Female. — Length, 4 mm.; height of abdomen, 1.6 mm.; width of abdomen, 1.2 mm.

Tergal portion of body dark reddish-brown marked with silvery white, the sternal portion silvery white, tinged with yellow.

Eye tubercle wide and deeply hollowed between the eyes; a black ring around each eye surrounded by light yellowish gray; the rest of the tubercle brownish yellow except a median stripe and the whole anterior face which are silvery.

*A list of the Capsids has been prepared by Mr. Heidemann and immediately follows this paper.

The lateral and anterior border of the cephalothorax edged with silver except where interrupted in front by a narrow median reddish brown stripe. Dorsum of cephalothorax behind the eye tubercle marked by two transverse sutures thus giving three distinguishable segments of which the posterior is broad and the one preceding it very narrow. The dorsum of abdomen consists of nine segments including the pygidium; the ventral side, consists of seven segments including the hypopygidium; the sixth segment is nearly as wide as the fifth.

The silvery white dorsal marking consists of a median stripe broken into spots on the last three segments. On the dorsal aspect the borders of the segments are marked by transverse bands of silvery white, enlarged laterally, and thus forming a latero-dorsal row of spots. On the lateral aspect, between this row of spots and the edge of the tergum, the ground color is broken by many obscure yellowish brown spots; edge of tergum with a narrow border of the same color. There are two short erect spines on the anterior part of the first abdominal tergite. Each ventral

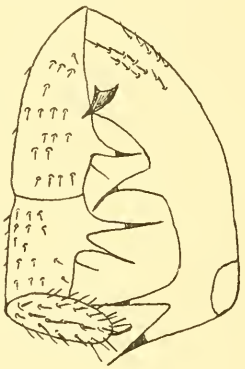


FIG. 4.

segment of the abdomen except the first armed with a single series of short black spines; the first segment with many similar spines not arranged in series; each coxa with a series of spines on the ventral surface.

Ovipositor banded with light brown, the bands divided into half rings by a longitudinal white line on each side. Each band has a single row of black hairs borne on little white tubercles; the branched portion darker with white tips and with the hairs longer; sheath of the ovipositor with granulations in rows crossing each other at an oblique angle.

Cheliceræ light with a silvery reflection, darker above and on base of second segment; claws nearly black; three small spines near the end of first segment above and a few on distal end of second segment.

Palpus light, darker above, trochanter with scattered stiff hairs below and a few above, three long black-tipped spines on basal part of femur, two hairs near base of first spine and one between second and third, a few stiff hairs on dorsal side; the tip has a projection on the inside covered by a number of strong setæ. Patella, tibia and tarsus clothed on the inside with strong setæ, the outer surface also sparingly clothed with weaker setæ which become stronger on the tarsus.

The following table gives in millimeters the length of the segments of the legs and palpus. The figures in parentheses give the number of false joints.

Legs.	I.	II.	IV.	Palpus.
Fem.	1.34	1.91	1.44	.4
Pat.	.38	.41	.41	.4
Tib.	1.7	2.4	2.18	.4
Met.	2.52 (4)	2.86 (6 or 5)	4 (7)	
Tar.	3.46 (18)	4.3 (24)	5.23 (24)	.6

This species differs from *C. agilis* Banks in the more angular outline of the eye tubercle, in the greater depth of the median furrow and in the proportion of the segments of the palpus, the femur, patella and tibia being about equal in length. It is also larger and the color markings do not agree with the description of that species.

One specimen was taken after a heavy rain on a tree trunk on a heavily wooded bank near Ithaca, N. Y., August, 1903.

Caddo troöpis, new species.

Female. — Length, 1 mm.; width of abdomen, .6 mm.; width of eye tubercle .48 mm.

Dorsum of body reddish brown crossed by narrow light lines broken into spots near the edge; underside grayish brown. Eye tubercle very large and provided with a broad furrow, dull yellow in the furrow and in front. Each eye with a broad, black ring surrounded by yellowish.

On the tergum two segments are visible on the cephalothorax and eight besides the pygidium on the abdomen; the ventral surface of the abdomen consists of seven segments including the hypopygidium.

Cheliceræ whitish except the claws which are black. Legs and palpus dark gray. Trochanter of palpus armed beneath with a large tubercle bearing two spines, one large and one small; two large spine-bearing tubercles at base of femur, one at middle of the ventral side and near the tip on the inside; one on the proximal half of the patella and two on the tibia below. The outer side of the whole palpus nearly naked, while the inner side is thickly clothed with strong hairs becoming more dense on the tarsus. The tarsus is directed obliquely mesad. Ovipositor short, armed with three transverse rows of setæ before the fork; each branch black at tip and armed with many black setæ and one large five-branched spine.

Legs	I.	II.	III.	IV.	Palpus.
Fem.	.43	.67	.55	.84	.41
Pat.	.14	.17	.14	.19	.24
Tib.	.36	.53	.38	.5	.14
Met.	.46	.55	.53	.86	
Tar.	.55 (6)	.77 (6)	.67 (6)	.91 (7)	.17

Two specimens taken in sifting leaves on a heavily wooded bank near Ithaca, N. Y., August, 1904.

Leiobunum calcar Wood.

Female.—Length, 7.4 mm. ; width, 4 mm.

Dorsum mottled yellow and brown with the brown central marking distinct in front and darker in spots along the edge. Back of the eye tubercle the marking covers about one half the width of the cephalothorax. It narrows to the second abdominal segment, and then gradually expands posteriorly at the same time becoming more indistinct. Abdomen marked beneath with gray brown transverse bands separated by bands of light gray. Coxæ darker than in the male ; legs lighter. Cheliceræ uniform grayish yellow except the tips of the claws, which are black.

Trochanter of palpus brownish yellow, patella and tibia darker, tarsus much lighter ; femur armed below with a row of short tubercles, slightly more distinct at the place corresponding to that occupied by the process in the male. Patella enlarged distally on the inside and thickly clothed with fine stiff hairs ; dorsal and lateral surface armed with scattered blunt tubercles. Tibia armed below with a row of blunt tubercles. Tarsus without tubercles, but clothed with fine white appressed hairs and black erect setæ.

Wood (Comm. Essex Inst., VI, p. 27) described a female Phalangid which he doubtfully considered the female of this species. Weed (Am. Nat., XXI, p. 935 ; Bull. Ill. St. Lab. Nat. Hist., III, p. 90 ; Proc. U. S. Nat. Mus., XVI, p. 554) has expressed a doubt as to the generic position of this species owing to the presence of a process on the femur of the palpus of the male.

A pair of this species *in coitu* was collected by Prof. J. H. Comstock at Taughannock Falls, N. Y., August 21, 1902.

I wish to thank Professor Comstock for the privilege of using material in the Cornell University collections and for many valuable suggestions in the preparation of this paper.

PHALANGIDS IN THE DISTRICT OF COLUMBIA.

The following Phalangids have been taken in the vicinity of Washington, D. C. *Scotolemon flavescens* Pack. Under dead leaves. *Caddo agilis* Banks. Among dead leaves, variable in markings, type was immature. *Liobunum nigripalpi* Wood. Uncommon. *Liobunum crassipalpis* Banks. One specimen. *Liobunum vittatum* Say. Abundant. *Liobunum longipes* Weed. In small trees. *Liobunum formosum* Wood. Common. *Liobunum politum* Weed. Common. *Liobunum ventricosum* Wood. Rather common. *Hadrobunus grande* Wood. Not rare.

NATHAN BANKS.

JOURNAL

OF THE

New York Entomological Society.

Publishes articles relating to any class of the subkingdom Arthropoda, subject to the acceptance of the Publication Committee. Original communications in this field are solicited.

Editorial.

In the article by Mr. Beyer in our last issue (page 168), there are three errors, chargeable to illegible manuscript. *Trachelicus miamana* should read *Trachelizus uncimanus*, *Vaseletia vaseleta* should read *Vasseletia vasseleti* and *Brenthus lutans*, on the last line, should be *Brenthus lucanus*. As Mr. Schaeffer was absent in Texas, we did not get these corrections in season.

We learn that some of the members of the Society think that a predominant place in the Journal should be given to articles on North American Coleoptera and Lepidoptera, since a majority of our readers are interested in these subjects. We have no objection to printing such articles, but have to depend on our contributors, since we are not able to write the whole Journal ourselves. The Coleopterists are given a hearing in this number. Now let the Lepidopterists send us their manuscript.

PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY.

Meeting of April 5, 1904.

Held at the residence of Mr. C. H. Roberts, 74 West 119th St. President C. H. Roberts in the chair with eleven members present.

The minutes of the last meeting were read and approved.

The librarian reported the receipt of the following exchanges:

Verhandl. d. k. k. zool.-bot. Gesellschaft, Vol. LIII, Nos. 5, 6, 7, 8 and 9.

Canadian Entomologist, Vol. XXXII, Nos. 8 and 9; Vol. XXXIII, No. 3;

Vol. XXXIV, No. 5; Vol. XXXV, No. 11; Vol. XXXVI, No. 1.

First Ann. Rep't. on the Noxious Insects of Illinois by B. D. Walsh, 2nd Edition. 1903.

Proc. of the Canad. Institute, N. S., Vol. II, Nos. 1, 2, 3 and 4.

Tijdschrift voor Entomologie 1903, No. 2.

Insect World, Vol. VII, No. 10.

New York Agricultural Exp. Station. Geneva, N. Y., Bull., Nos. 239 and 240.

U. S. Dept. of Agriculture; Division of Entomology, Bull., No. 43.

Philosophical Soc. Washington, Bull., No. XIV, pp. 233–246.

Ohio Naturalist, Vol. IV, Nos. 1, 2, 3.

Proceedings of the American Academy of Arts and Sciences, Vol. XXXIX, Nos. 6–14.

Ann. del Museo Nacional de Montevideo, Vol. II, 1903.

Mr. Davis of the field committee reported that the first meeting of the season had been arranged for Sunday April 17 to Great Kill, Staten Island.

On motion of Mr. Groth the librarian was instructed to send to Mrs. Elliman, three copies of the JOURNAL containing the resolutions on the death of Mr. A. R. Grote.

Mr. E. D. Harris read a paper on "Some Cicindelidæ recently received from British Columbia." Discussed by Messrs. Beyer, Leng and Schaeffer.

Mr. Roberts made some remarks on the Haliplidæ and exibited specimens of nearly all of the known species as well as several that were undoubtedly new. He stated that he had found well defined characters for separating many of the species in the peculiar form of the front tarsi.

MEETING OF APRIL 19, 1904.

Held at the American Museum of Natural History. President C. H. Roberts in the chair and nine members and three visitors in attendance.

The minutes of the previous meeting read and approved.

The librarian reported the receipt of the following exchanges:

Canadian Entomologist XXXVI, No. 1.

Deutsche Ent. Zeitschrift, No. 1, 1904.

The resignation of Mr. John D. Sherman as an active member of the society was presented and on motion of Mr. Groth was accepted with regret.

Mr. Davis exhibited a number of deformed insects, among which were several deformed Cecropia moths, an American silk worm moth with the left forewing wanting several grasshoppers with bowed hind tibiæ and a walking stick with the left hind leg much aborted.

Mr. Schaeffer, under "Some Notes on Coleoptera," remarked that he became interested in the North American Cassidini while working on the material of this tribe of Chrysomelidæ collected by him in Brownsville and as Crotch's paper is of very little help in the identification of our species he intends to publish a short synopsis of the Cassidini with colored figures of every species, if possible. He exhibited representatives of nearly all the species known to him to occur in the United States. He stated that while Crotch enumerated fourteen species there are now known to occur twenty-five species of Cassidini in the United States. The species formerly reported as *Cassida viridis* or *thoracica* is not that species but *C. rubiginosa*. As he became

doubtful of the correctness of the former identification, Mr. Schaeffer sent specimens of this species to Mr. J. Weise, of Berlin, who pronounced them identical with the European species except that they lack the ferrugineous scutellar spot. *Eurypepla jamaicensis* Linn. is another species new to our fauna taken in Key West, Florida, and sent to him by Mr. Schwarz. The distinction between some of the closely allied species was given.

Mr. C. W. Leng gave an interesting account of the collecting trip which he and Dr. Love took in West Virginia last summer.

MEETING OF MAY 3, 1904.

Held at the American Museum of Natural History. In the absence of the President, the Vice-president, Mr. Leng, occupied the chair with twelve members and one visitor present.

The treasurer, Mr. Davis, reported a balance of $1,007.62 in the bank.

The secretary presented the resignation of Mr. R. Stutz, of Johnsonburg, Pa., which was accepted on motion of Mr. Joutel.

Mr. Davis, of the field committee, reported that two outings had been arranged, one to Great Notch, N. J., on May 15, and the other to Lakehurst, N. J., May 30, 31 and June 1.

On motion of the secretary the society voted to discontinue the meetings during June.

Mr. Franck read a paper on "The Genus *Anthocharis* and varieties," and exhibited specimens to illustrate.

He had recently examined about 600 specimens of *Anthocharis* which he had in stock representing nearly all of the species and varieties. On consulting the various authorities he discovered that they all disagreed regarding the variety *hyantis*. H. Edwards and Strecker treat it as a synonym of *creusa*. Smith in his new list retains it as a distinct species. Dyar in his recent list makes it a variety of *ausonides*. Skinner drops *coloradensis* as a variety of *ausonides* and accepts *hyantis* as a variety. Mr. Franck agreed with Dr. Skinner on this point. He thought there was but slight excuse for retaining *coloradensis* as a separate variety, as a long series shows all intergrades, and only by selecting extremes can perceptible differences be noticed.

He also gave some attention to the group containing *sara*, *reakirti*, *julia* and *stella*. The type form (summer form) of *sara* is easily recognized by its larger size and by the underside of the wings being much less olive colored. *Reakirti* (winter or early spring form) is easily fixed. He finds that the females are not always white as stated in descriptions for he has frequently received yellow females from various localities in California which were captured at the same time with white males. To *julia*, accepted as a variety of *sara*, yellow females are credited. He pointed out the slight differences between *reakirti* and *julia*. In examining a lot from Sonoma Co., California, of over 120 specimens he found all males of *reakirti* form, and females both white and yellow, white predominating. One lot from Verdi, Nevada, shows both *reakirti* and *julia* males, both white and yellow females. In one lot from Pasadena, California, both *julia* and *reakirti* males, all white females. But in one lot from Plumas Co., California, of over 200 specimens, all males both *reakirti* and *julia* forms are yellow and all females are yellow.

Mr. Franck stated in conclusion that *stella* is much more entitled to a variety-name than *julia* and the species, in his judgment, should be placed as follows: *Anthocharis sara* Bdvl., var. *julia* Edw., var *stella* Edw.

Mr. Beyer read a paper on "A Few Notes on Brenthidæ" illustrated by specimens. So far as known there are six species of this family in the United States, as follows: *Cylas formicarius* Fab, *Eupsalis minuta* Drury, *Trachelizus uncimanus*, *Vasseletia vasseleti*, *Brenthus anchorago* Linn., *Brenthus peninsularis* Horn.

Mr. Franck reported that he had recently received from Binghamton, N. Y., a specimen of *Colias philodice* having two heads, with three antennæ.

Mr. Leng called on Rev. C. J. S. Bethune to address a few remarks to the society. Mr. Bethune responded by giving an account of the early history of the Ontario Entomological Society and outlined some of the work which the society has been doing of recent years in connection with the Department of Agriculture of the Dominion of Canada.

The remarks were listened to with much interest and upon request of the Vice-President Dr. Zabriskie expressed the pleasure of the society in having Mr. Bethune with us and thanked him for his interesting talk.

MEETING OF MAY 17, 1904.

Held at the American Museum of Natural History. President Roberts in the chair with ten members present.

The minutes of the previous meeting read and approved.

The committee in reference to holding one meeting a month reported progress.

On motion of Mr. Joutel the society voted to donate $5.00 to the elevator man.

On motion of Mr. Leng the society voted to donate three volumes of the Journal to the Allgemeine Zeit. f. Ent.

Mr. Leng exhibited specimens of two varieties of *Omus* from the vicinity of Kaweah, California, collected by Mr. Ralph Hopping. The specimens are not identical with any previously described variety but approach nearest to *lævis* and *intermedius*. A letter from Mr. Hopping was shown with a sketch map of the vicinity showing that the *intermedius* form occurs in the chapparal belt, 3,000 to 4,500 feet elevation; while the *lævis* form occurs in the pine belt, elevation 5,000 to 7,000 feet.

Mr. Schaeffer mentioned that the Anthribidæ were well represented in Brownsville, Texas. Eighteen species were known to him to occur there of which several are new species; one or two *Taxotrapis*, one *Gonops*, one *Phœnicobius*, two *Anthribus*, a species near *Brachytarsis*, a new genus and a very interesting species which does not fit any of the genera known to him. This latter species has the cavities for the insertion of the antennæ visible from above and the prothoracic carina antebasal. These characters put it in Lecordaire's "Anthribides anocères, Group II, Natioxénides," but it differs greatly from the genus *Notioxenus* which makes the erection of a new genus for this species necessary. 16 out of the 18 known species were taken by him in Brownsville and were exhibited, also colored drawings of nearly all of the species of the North American Cassidini for his intended paper on this tribe of the Chrysomelidæ.

H. G. BARBER, Secretary.

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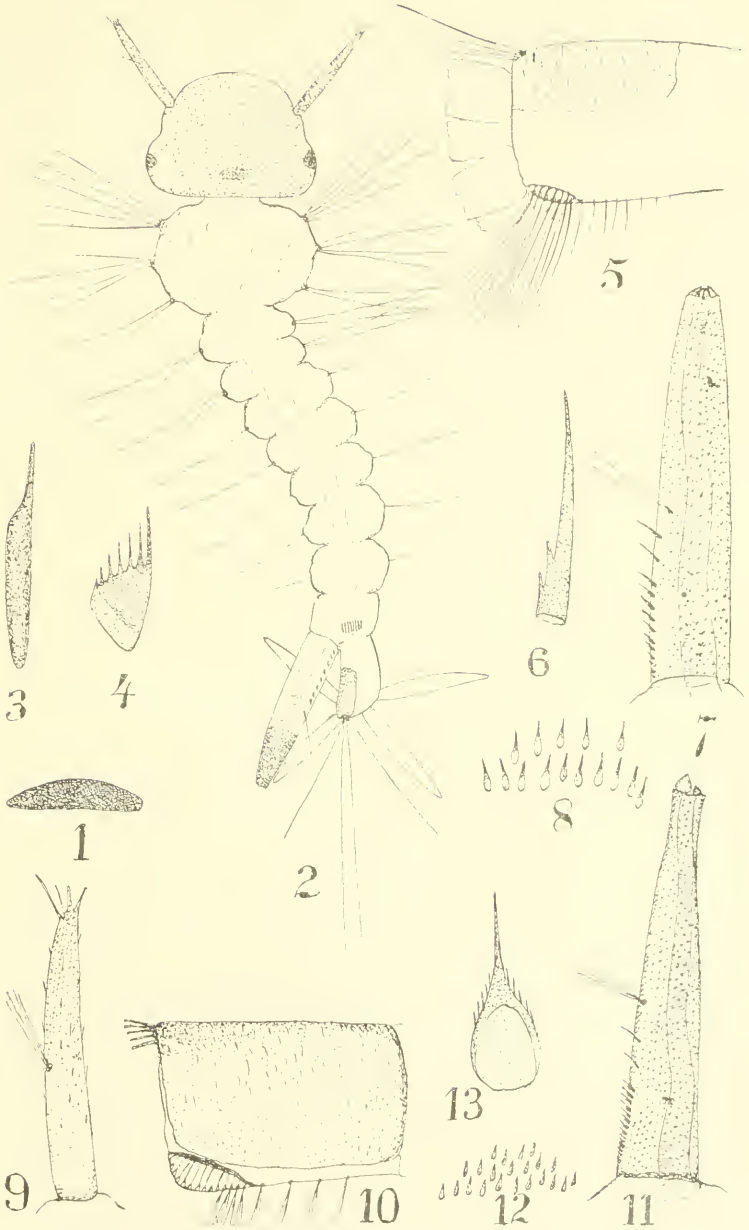
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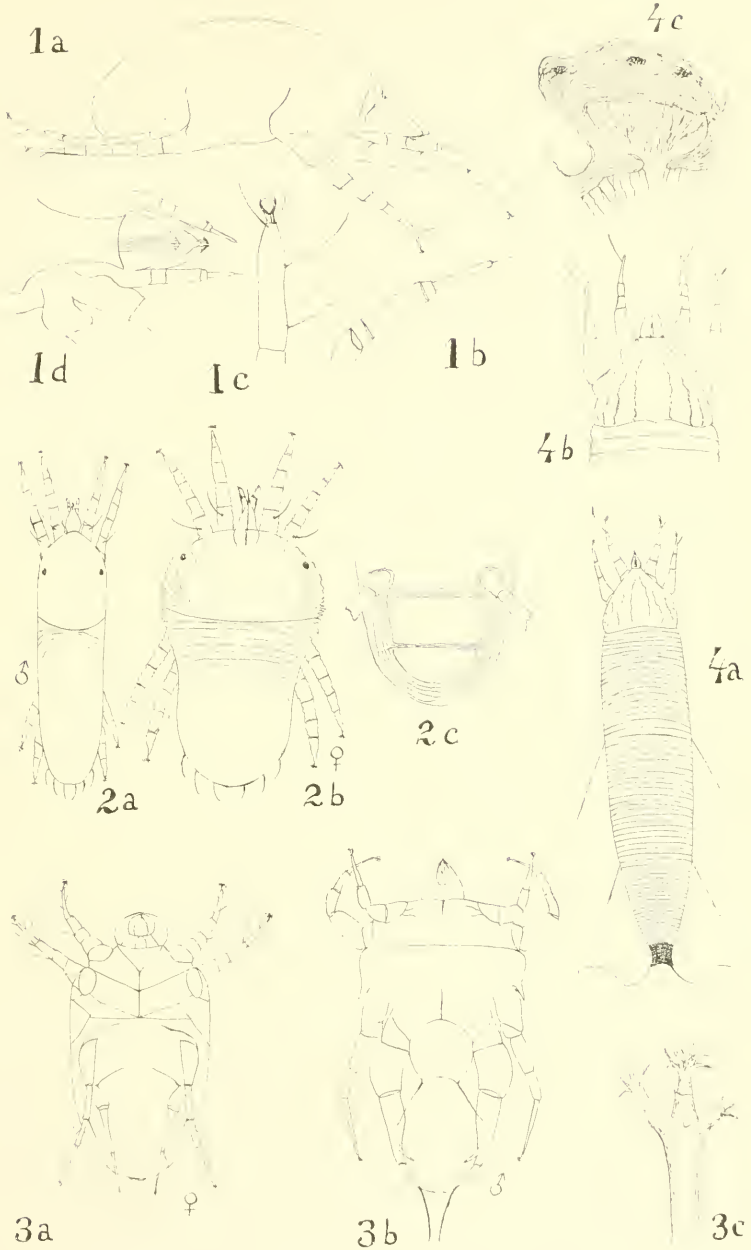
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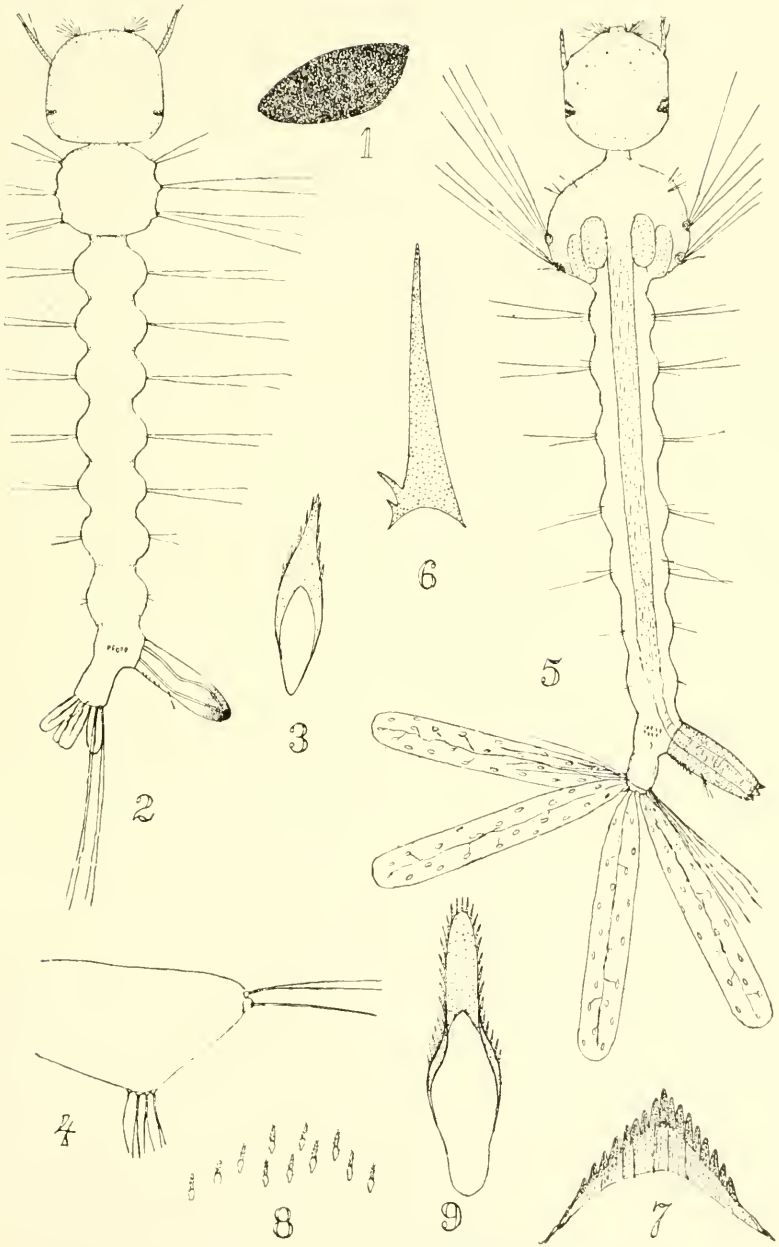
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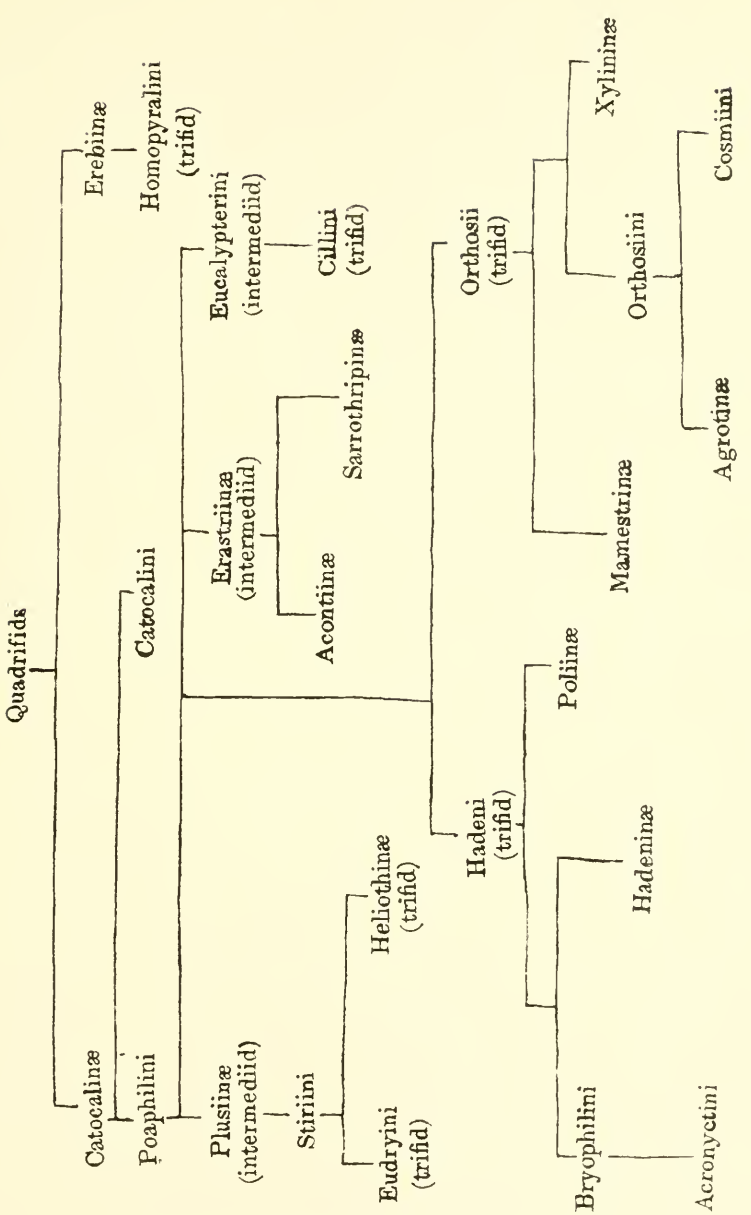
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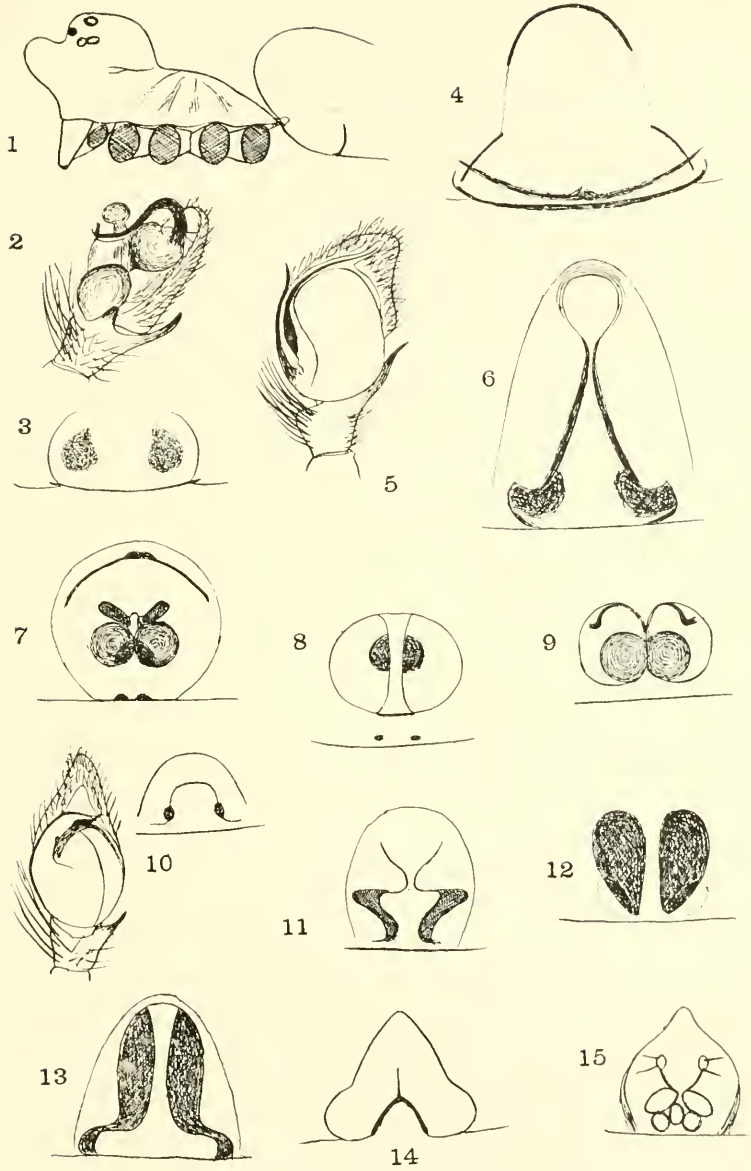
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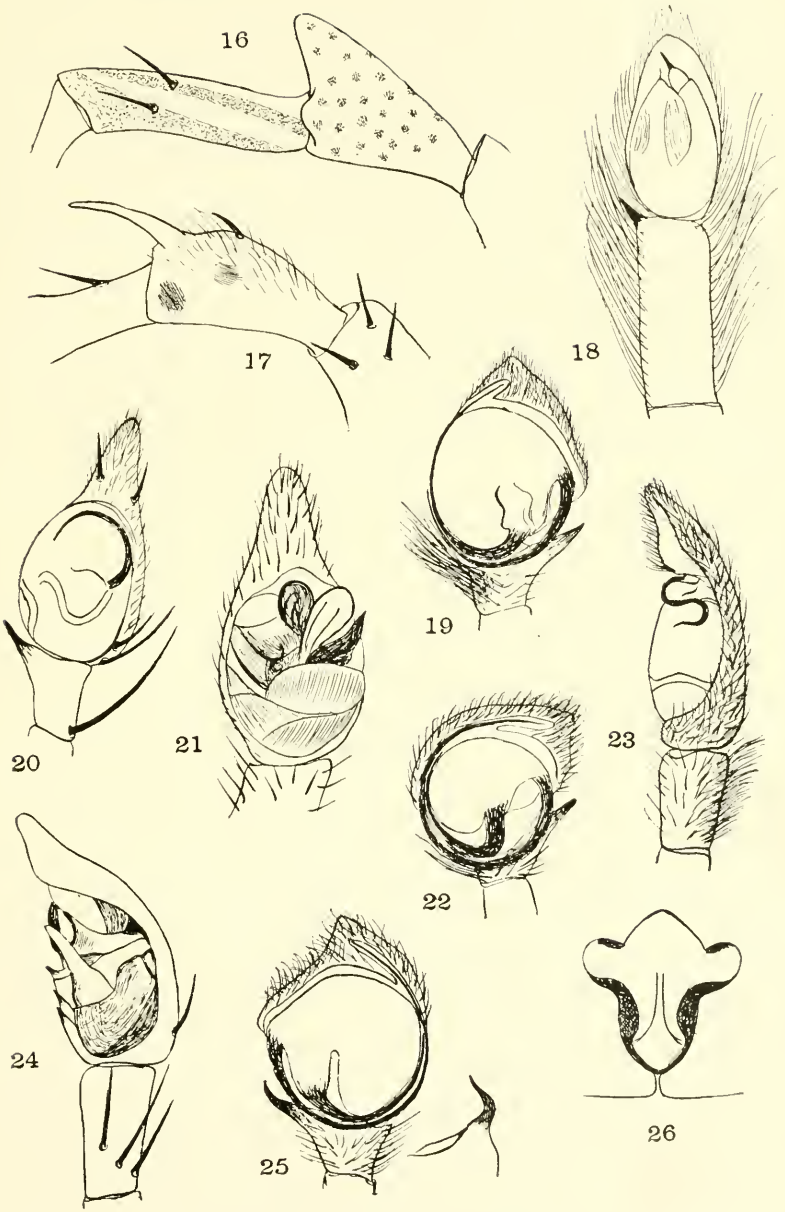
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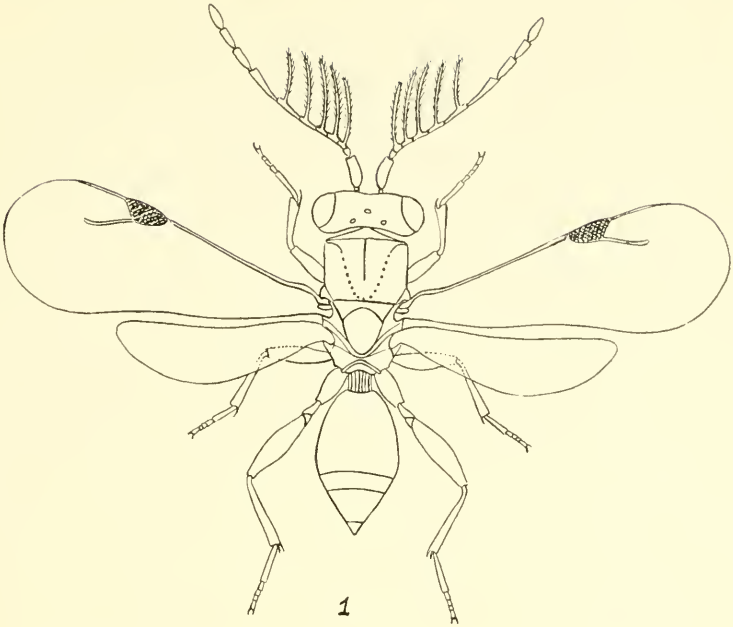
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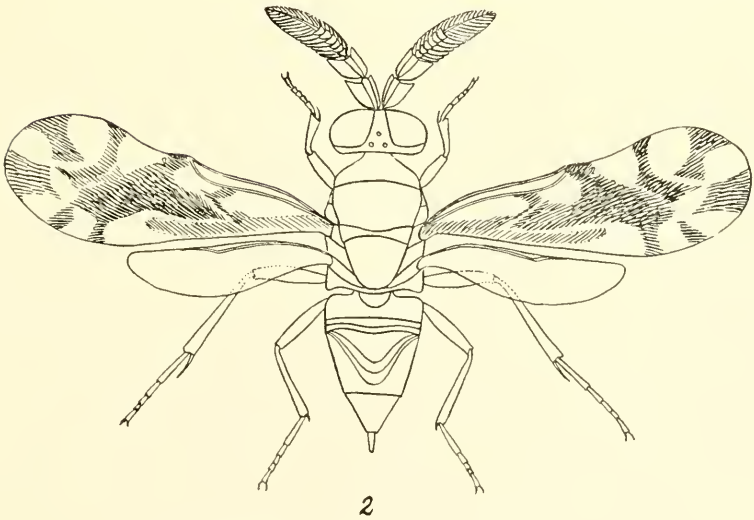
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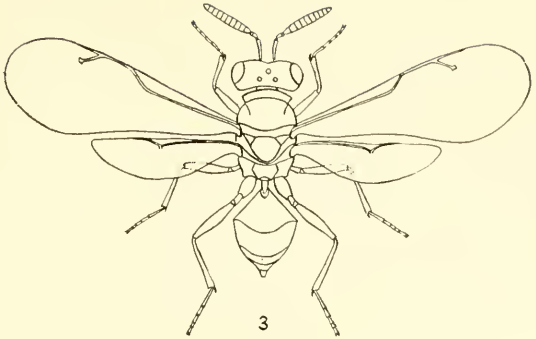


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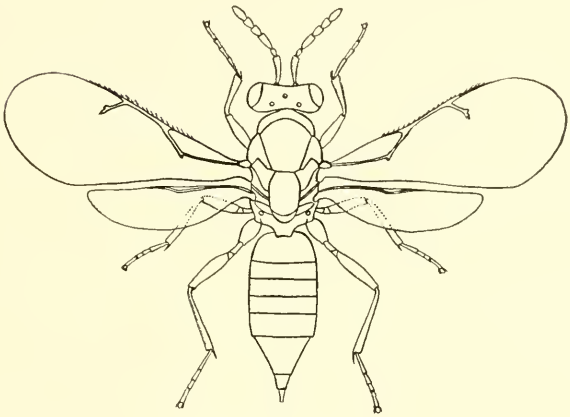


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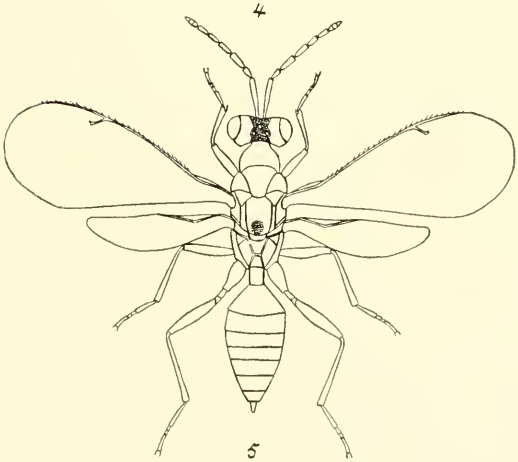
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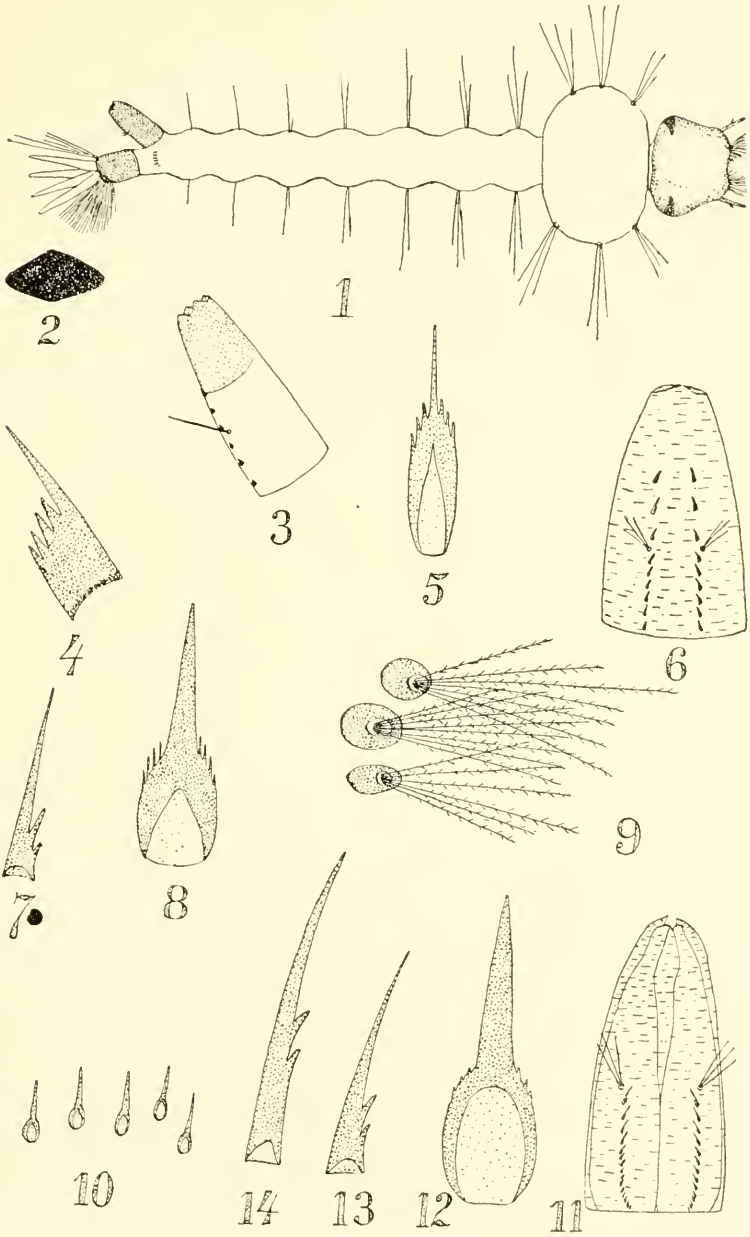


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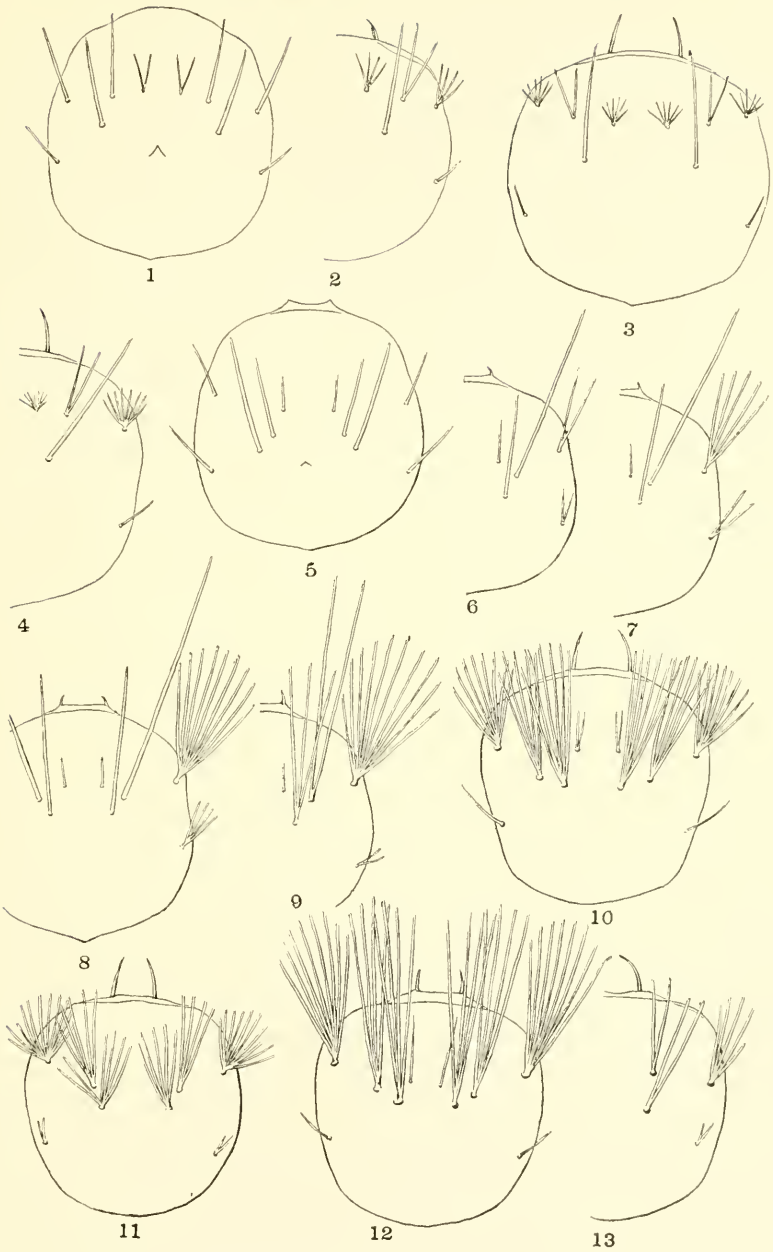


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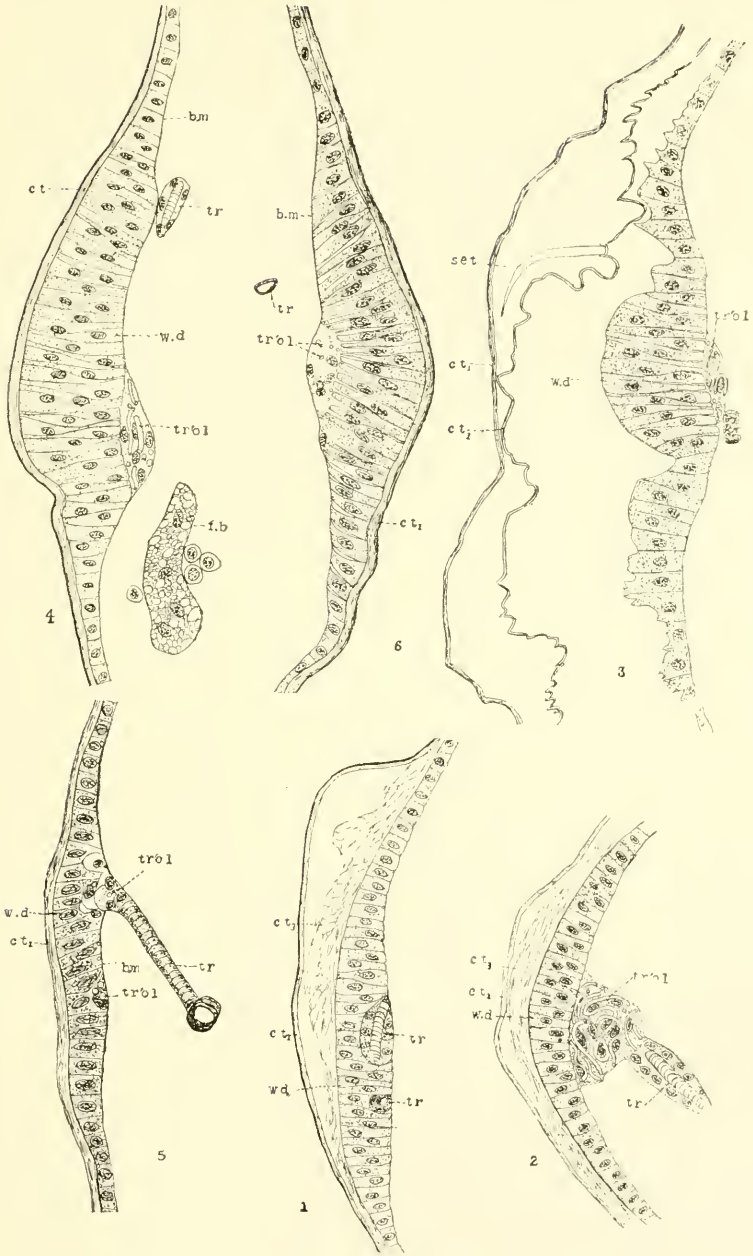
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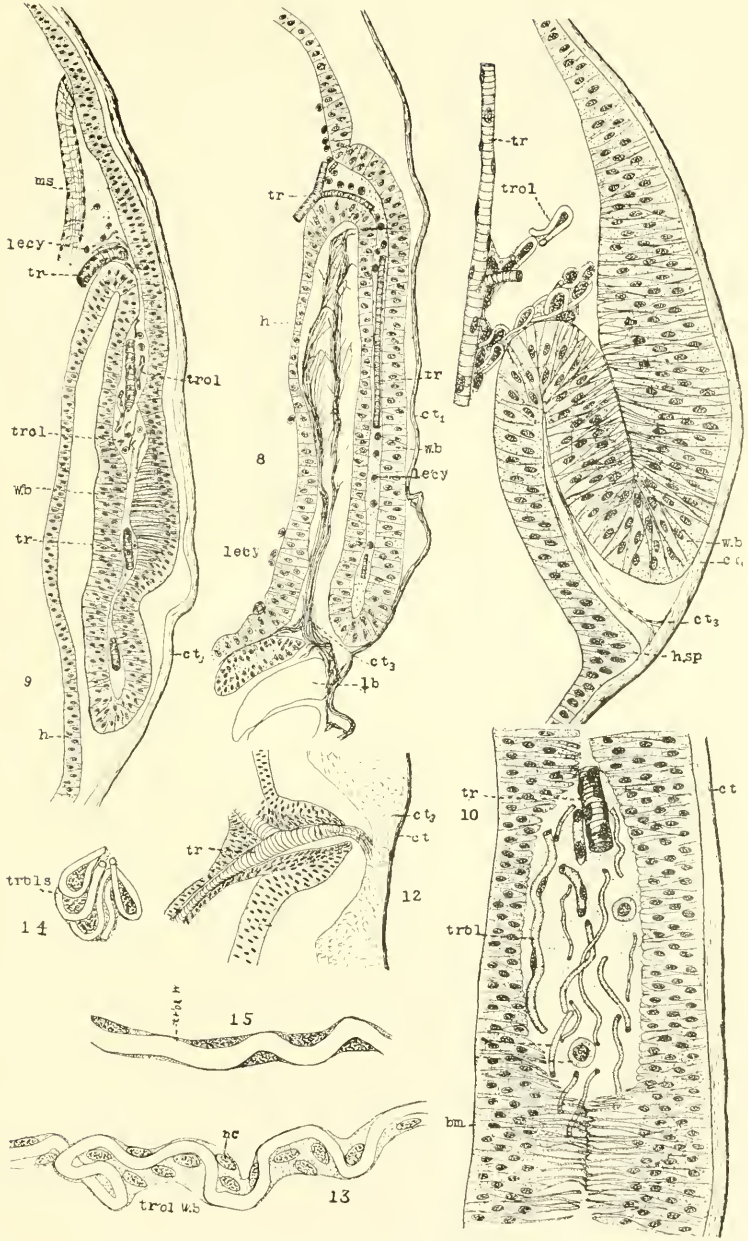
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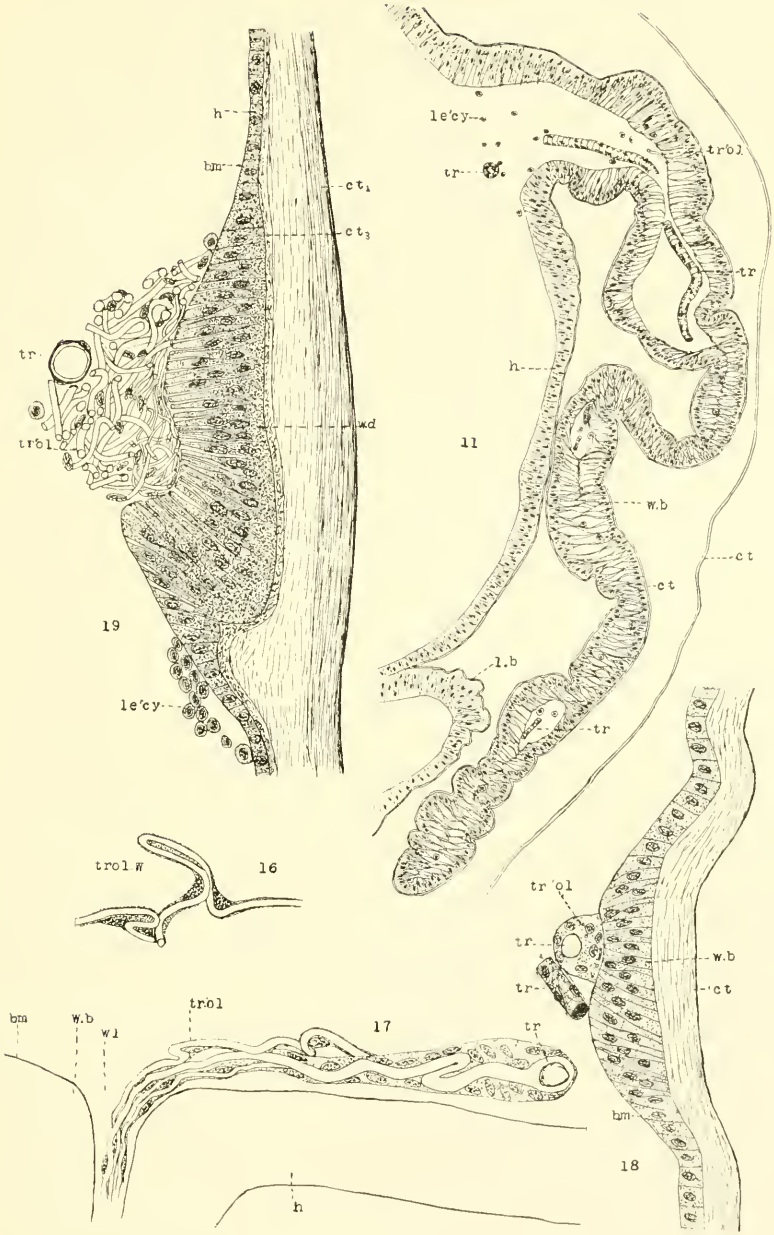
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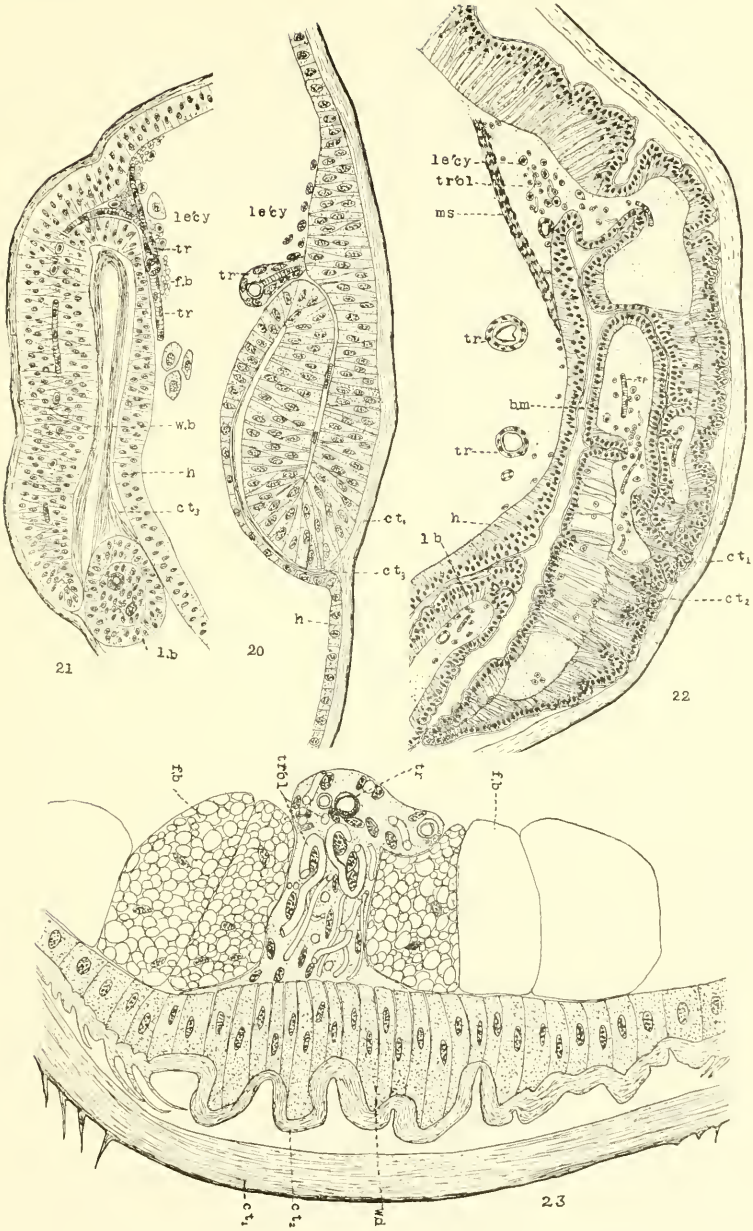
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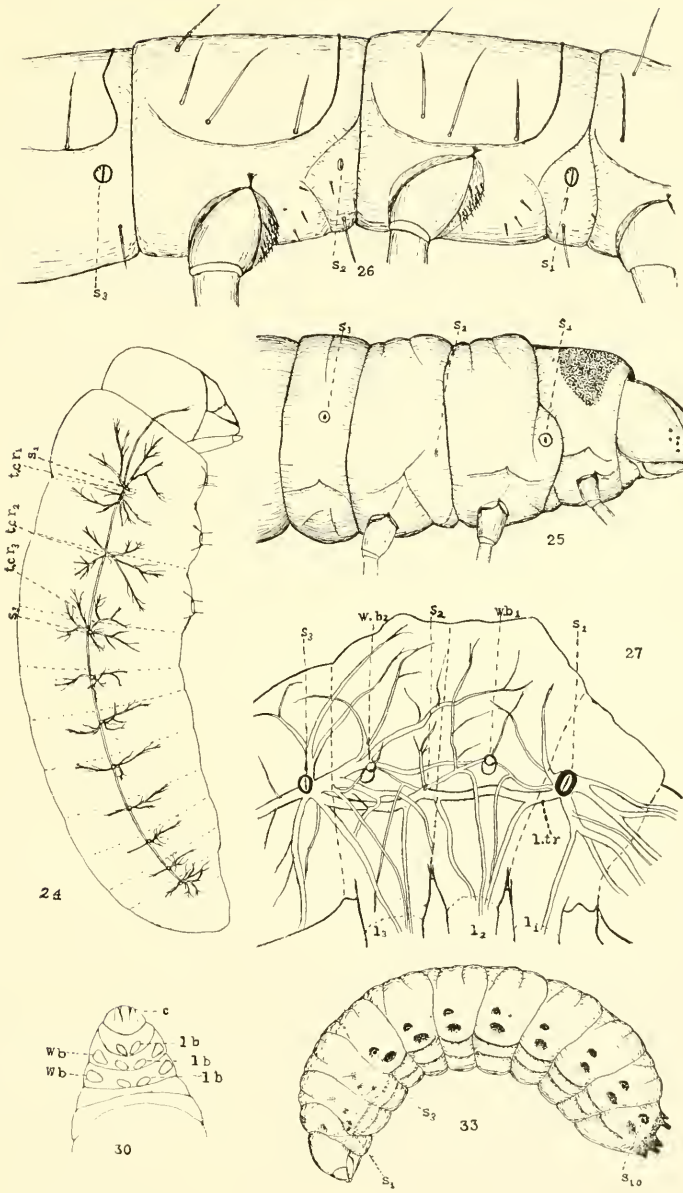
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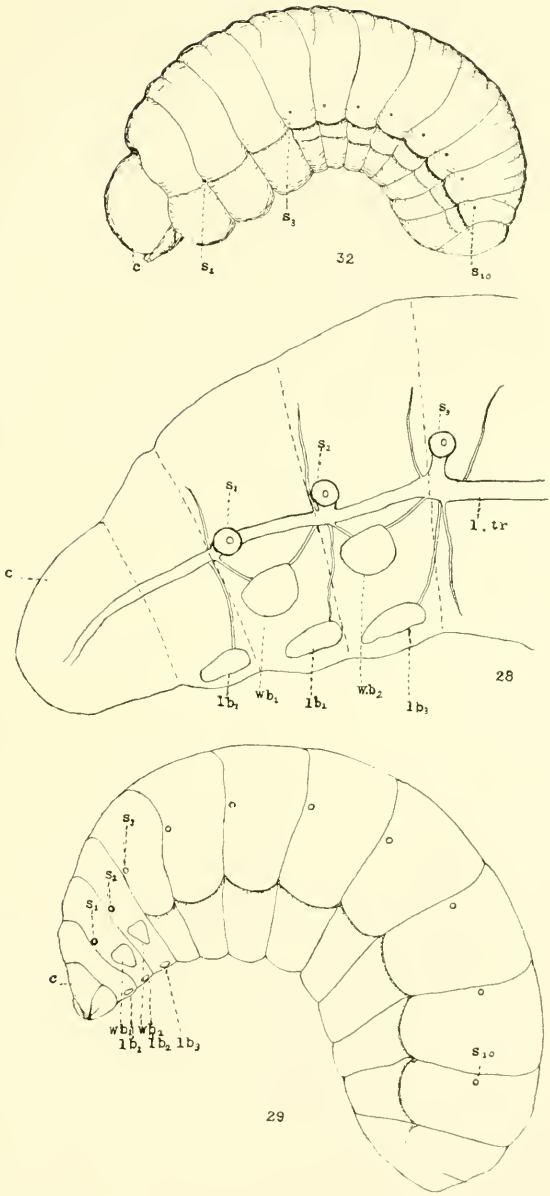
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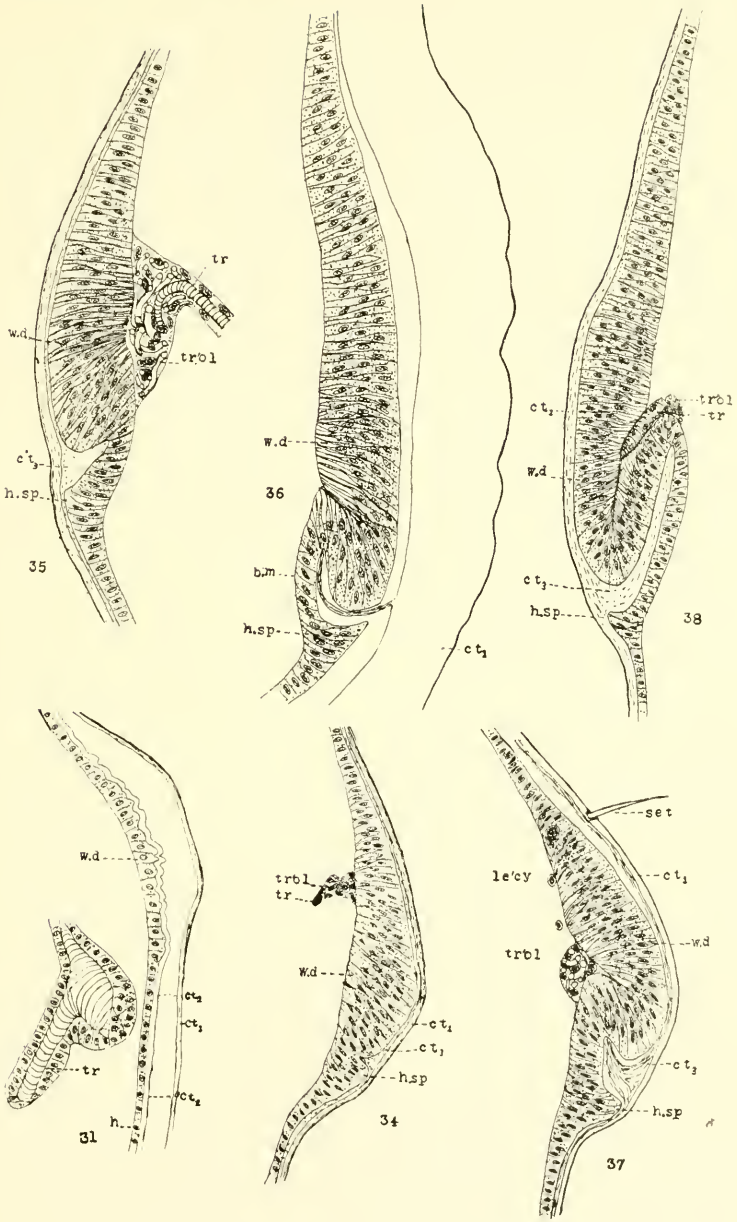
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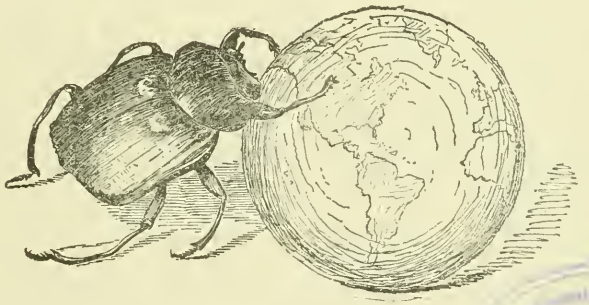
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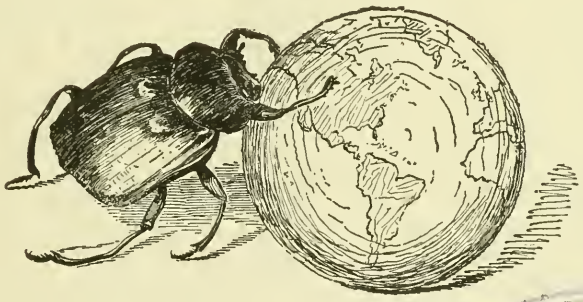
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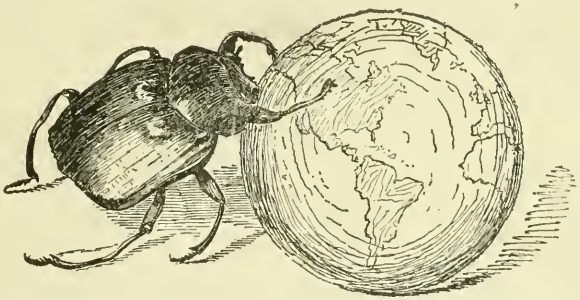
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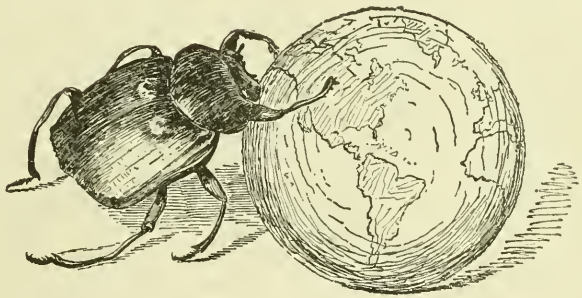
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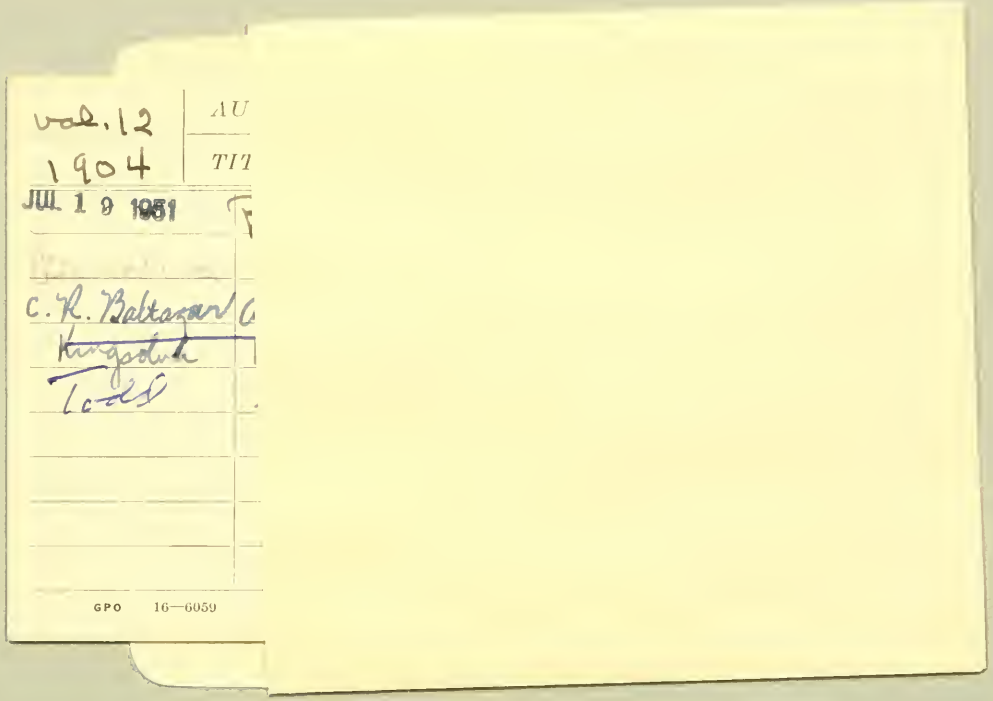
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